Automotive PC

Carputer

Combining with more than one decade of in-vehicle computing device ODM experiences and innovative design concepts, IEIMobile provides applicable in-vehicle computing solutions in all aspects.

Carputer is the predominant term used to describe a category of mobile computer designed or modified to specifically be installed and run in automobiles. Originally many do-it-your-selfers have built carputers from laptops and small form factor computers based on industrial personal computer technology and connected with several external peripherals such as GPS receiver, GPRS modem, vehicle power supply, and On-Board Diagnostics (OBD-II) converter.

Now mobile technology and new IT solution causes the creation of more advanced carputers that integrate all these peripherals in one single device to become more compact, rugged, applicable, and survivable in vehicle environment. The popularity of carputer also brings the booming of carputer providers to come out with different product alias like Car-PC, vehicle PC, vehicle computer, in-vehicle computer, auto PC, car computer, or vehicle-mounted computer.

In-Vehicle Infotainment (IVI)

The growing needs to access information in remote, mobile environments have sparked interests in so-called In-Vehicle Telematics Systems (IVTS). These relatively new systems have the potential to deliver computing facilitates to road vehicles, which may include in-vehicle infotainment, route-guidance and navigation and the provision of vital information resources used by fleet haulage companies and emergency services (police, fire and ambulance).

In-Vehicle Infotainment (IVI) systems are devices that deliver navigation, entertainment, and networked computing services in vehicles, such as cars, trucks, planes, and buses. Automotive manufacturers in particular are increasingly viewing IVI systems as a key differentiator in their products. Drivers and passengers are coming to expect the same type of innovations they see in other devices, such as mobile computers and handsets, in their vehicles. As vehicles become connected to the internet, the demand for internet-based entertainment applications and services increases and IEIMobile strives to accelerate the pace of innovation in IVI.

Location-Based Service (LBS)

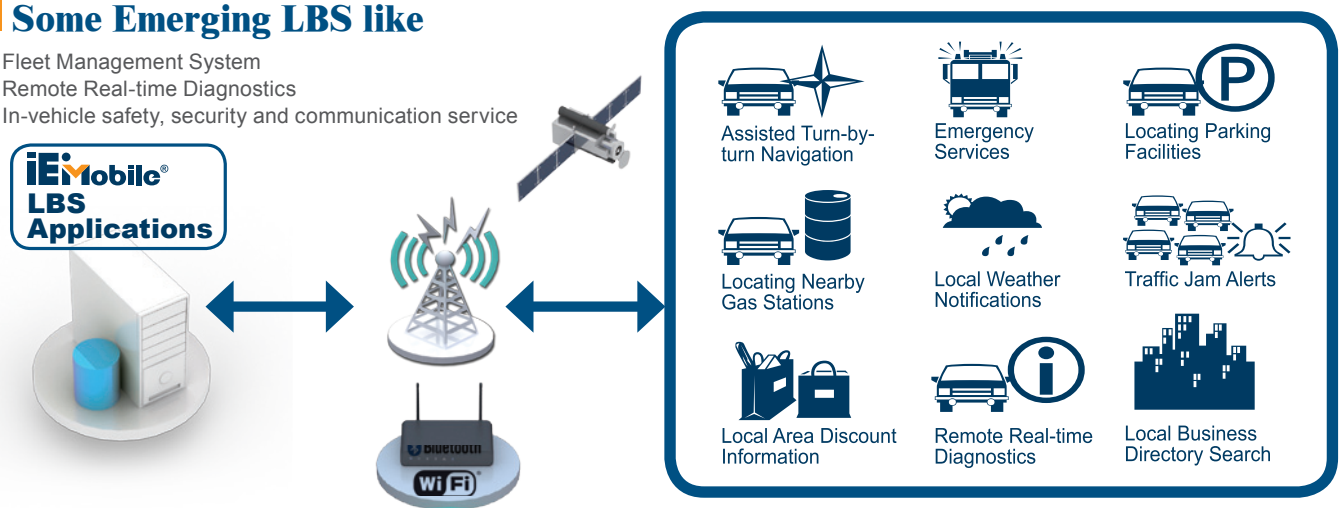
A location-based service (LBS) is an information and entertainment service, accessible with mobile devices through the mobile network and utilizing the ability to make use of the geographical position of the mobile device. These emerging growing markets of LBS require mobile devices, wireless service and GPS satellite signals to be available and operating for features to function properly.

Mobile messaging plays an essential role in LBS. Messaging, especially SMS, has been used in combination with various LBS applications, such as location-based mobile advertising. SMS is still the main technology carrying mobile advertising / marketing campaigns to mobile devices. A classic example of LBS applications using SMS is the delivery of mobile coupons or discounts to mobile subscribers who are near the advertising restaurants, cafes, movie theatres.

IEIMobile is dedicated to provide industrial mobile electronics devices along with turnkey software solutions to leverage LBS providers and operators to focus on their application and business developments.

Some Emerging LBS like

- Fleet Management System
- Remote Real-time Diagnostics
- In-vehicle safety, security and communication service



On-Board Diagnostics (OBD-II)

- On-Board Diagnostics, or OBD, in an automotive context, is a generic term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or a repair technician access to state-of-health information for various vehicle sub-systems.
- OBD-II is a standard that specifies the type of diagnostic connector and its pin-out, the electrical signaling protocols available, and the messaging format.
- Almost all of the automobiles produced today are required, by law, to provide an interface for connecting a diagnostic test equipment.

OBD-II Cable

Pin	Description
1	Manufacturer discretion. GM: J2411 GMLAN/SWC/Single-Wire CAN.
2	Bus positive Line of SAE-J1850 PWM and SAE-1850 VPW
3	Ford DCL(+) Argentina, Brazil (pre OBD-II) 1997-2000, Usa, Europe, etc. Chrysler CCD Bus(+)
4	Chassis ground
5	Signal ground
6	CAN high (ISO 15765-4 and SAE-J2284)
7	K line of ISO 9141-2 and ISO 14230-4
8	-
9	-
10	Bus negative Line of SAE-J1850 PWM only (not SAE-1850 VPW)
11	Ford DCL(-) Argentina, Brazil (pre OBD-II) 1997-2000, Usa, Europe, etc. Chrysler CCD Bus(-)
12	-
13	-
14	CAN low (ISO 15765-4 and SAE-J2284)
15	L line of ISO 9141-2 and ISO 14230-4
16	Battery voltage

There are five signalling protocols currently in use with the OBD-II interface. Any given vehicle will likely only implement one of the protocols.

- SAE J1850 PWM (pulse-width modulation - 41.6 kB/sec, standard of the Ford Motor Company)
- SAE J1850 VPW (variable pulse width - 10.4/41.6 kB/sec, standard of General Motors)
- ISO 9141-2. K-line and L-line. This protocol has an asynchronous serial data rate of 10.4 kBaud. It is primarily used in Chrysler, European, and Asian vehicles.
- ISO 14230 KWP2000 (Keyword Protocol 2000)
- ISO 15765 CAN (250 kBit/s or 500 kBit/s). The CAN protocol is a popular standard outside of the US automotive industry and is making significant in-roads into the OBD-II market share. By 2008, all vehicles sold in the US will be required to implement CAN, thus eliminating the ambiguity of the existing five signalling protocols.

OBD-II provides access to numerous data from the engine control unit (ECU) and offers a valuable source of information when troubleshooting problems inside a vehicle. The SAE J1979 standard defines a method for requesting various diagnostic data and a list of standard parameters that might be available from the ECU. Following is a list of vehicle diagnostic information you can read from OBD-II. It also shows a sample screen shot from IEIMobile Automotive PC.

- Vehicle speed
- Engine RPM

- Total fuel used (litre since life time)
- High resolution vehicle distance

- Engine coolant temperature
- Vehicle ambient temperature

- Tachograph information
- Total engine hours (h)

- Fuel level (0–100 %)
- Fuel pressure
- Fuel system status

- DTC (Diagnostic Trouble Code)

- Calculated engine load
- Intake air temperature
- Throttle position

- Accelerator pedal position (0–100 %)
- Axle weight (kg)
- Oxygen sensors and status

- Clutch switch (on/off)
- Brake switch (on/off)
- Cruise control (on/off)
- PTO (Status/Mode)

OBD-II Applications

Hand-held or PC-based scan tools

- Read simple error codes, possibly without translating the meaning, and reset those error codes
- Access more advanced diagnostics
- Set manufacturer- or vehicle-specific ECU parameters
- Access and control other control units, such as air bag or ABS
- Real-time monitoring or graphing of engine parameters to facilitate diagnosis or tuning

In-Vehicle data logger

- Capture vehicle data while the vehicle is in normal operation, for later analysis
- Engine and vehicle monitoring under normal operation, for the purpose of diagnosis or tuning
- Auto insurance risk selection. Auto insurance companies offer reduced premiums if OBD-II vehicle data loggers or cameras are installed, and if the driver's behaviour meets requirements

Fleet management and remote real-time diagnostics

- Monitoring of driver behaviour by fleet vehicle operators
- Real-time vehicle fault alarm and alert
- Enhanced automatic vehicle maintenance

Auto Service

Car Racing

Rental & Insurance

Fleet Management

SAE J1939 Applications

SAE J1939 has been adopted widely by diesel engines. Applications of J1939 now include off-highway, truck, bus, and even some passenger car applications, All J1939 packets contain eight bytes of data and a standard header which contains an index called PGN (Parameter Group Number). J1939 defines standard PGNs to encompass a wide range of automotive, agricultural, construction, marine and off-road vehicle purposes.

Off-Road

Marine

Construction

Bus & Truck

Diesel Engine

Agricultural

IEIMobile In-Vehicle Computing Devices Provide Full OBD-II Support

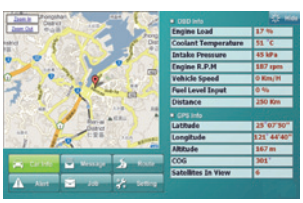
Bundled OBD-II Connector or Cable

Pre-installed firmware supports all the most popular in-vehicle bus standards and protocols

- The protocol firmware automatically scans the vehicle bus to check and confirm what protocol its connected vehicle supports
- The protocol firmware acts as a converter between vehicle bus and user application software
- User application software sends requests to the protocol firmware to access vehicle bus data

Complete Software Development Kits (SDK)

- Software Library provides easy-to-use Application Programming Interfaces (API's) for application software programming
- Demo source code for reference
- Support SAE J1979 standard to access OBD-II data and code
- Complete user manual for programming



Fleet Management System (FMS)

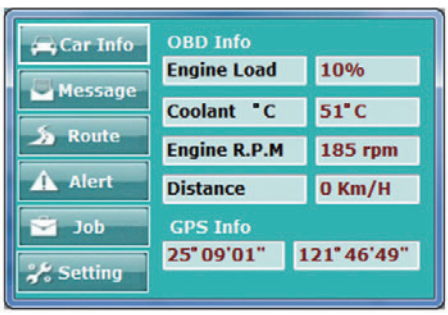
Fleet management can include a range of functions, such as vehicle financing, vehicle maintenance, vehicle telematics (tracking and diagnostics), driver management, fuel management and health & safety management. It can remove or minimize the risks associated with vehicle investment, improving efficiency, productivity and reducing their overall transportation costs. A main function of the fleet management software is to gather, store, process, monitor, report on and export information. The most basic function in all fleet management systems is the vehicle tracking component which is usually GPS based.

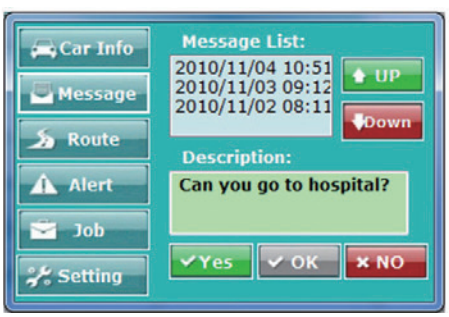
IEI FMS Architecture

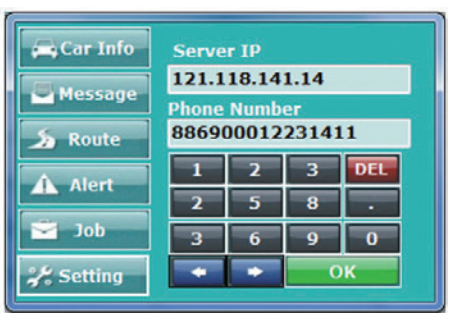
IEIMobile in-vehicle computing solutions provides free fleet management software demo, the IEI FMS. This software is based on client/server architecture. The server-side software is contained in the bundled CD to be installed in Windows® desktop PC. The client-side software is pre-installed in each IEIMobile in-vehicle computing device. IEI FMS demonstrates most basic function of fleet management software such as to gather, store, process, monitor, report on and export information.

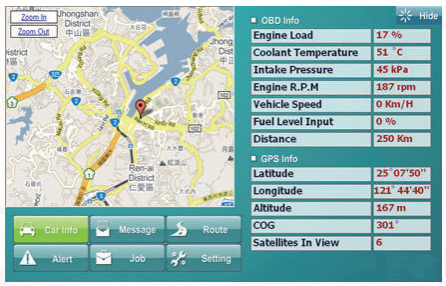
Server-side Screen Shot

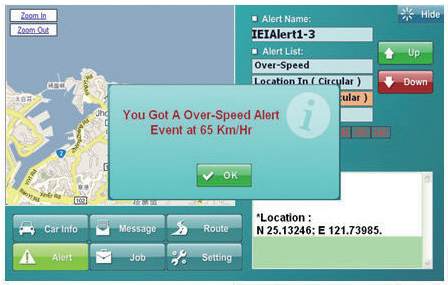
Client-side Screen Shot

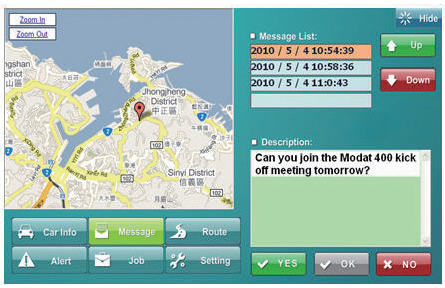












Automotive PC

New

Model		iKarPC	VTT-1000	AVL-2000	AVL-3000
Display	LCD Size	8" TFT-LCD (Sunlight readable)	3.5" TFT-LCD	N/A	N/A
	Brightness (cd/m²)	600 cd/m² High Brightness	450 cd/m²	N/A	N/A
	Max Resolution	800 x 480 pixels WVGA	320 x 240 pixels QVGA	N/A	N/A
	Viewing Angle	60/60/50/50 Deg.	50/55/60/60 Deg.	N/A	N/A
	Touch Screen	5-Wire Resistive Type Touch	4-Wire Resistive Type Touch	N/A	N/A
System	CPU	Intel® Atom™ Z510 1.1GHz	Samsung® S3C2416 ARM9 400 MHz	Intel® Atom™ Z510 1.1GHz	Intel® Atom™ CedarView N2600 1.6Ghz
	Chipset	Iintel® US15WP	N/A	Intel® US15WP	Intel® NM10
	Operation System	Microsoft® Windows® XP Embedded	Microsoft® Windows® CE 6.0	Microsoft® Windows® XP Embedded	Windows Embedded Standard 7 E
	Memory	1GB DDR2 533 MHz On-board	128MB DDR2 133MHz On-board	1GB DDR2 533MHz On-board	2GB 800 MHz DDR3
	Storage	4GB CompactFlash® SD Card Slot	256MB NAND FLASH microSD Card Slot	4GB CompactFlash® SD Card Slot	1 x Built-in 16G SATA SSD 1 x SDXC Slot for data storage
Communication	Wireless LAN	Wi-Fi 802.11 b/g/n	N/A	Wi-Fi 802.11b/g	802.11b/g/n
	Bluetooth	Bluetooth 2.1+ EDR (Class I)	N/A	N/A	Bluetooth V2.0+EDR (Class I)
	Data Rate	WCDMA/HSUPA	GSM/GPRS	WCDMA/HSUPA	WCDMA/HSUPA
	GPS	GPS w/ Internal Antenna	GPS w/ Internal Antenna	GPS w/ Internal Antenna	GPS
Multimedia	Audio	1 x Line-in 1 x Line-out 1 x 3W Speaker	1 x Line-out 1 x 1.5W Speaker	1 x Line-in 1 x Line-out	1 x Mic-in 1 x Line-out
Data Collection	RFID	N/A	N/A	ISO 18000-6C UHF RFID (Option)	ISO 18000-6C UHF RFID (Option)
	Video Capturing	N/A	N/A	Video Input : 4 channels composite video (NTSC/PAL/SECAM)	Video Input : 4 channels composite video (NTSC/PAL/SECAM)
	Camera	3 megapixels CMOS Camera	N/A	N/A	N/A
Compress	HW Compress	N/A	N/A	N/A	IVCPM-T504
	SW Compress	N/A	N/A	N/A	IVCPM-T604
LED indicators & Buttons	Indicators	Wi-Fi/Bluetooth/HDD/3.75G/ DVB-T/Power Status LED	Power/GPS/2.5G Status LED	UHF/Wi-Fi/Bluetooth/422/485/ HDD/3.75G/BAT/Power Status LED	1 x POWER LED
	Hot Key & Buttons	F1~F6 Function Key, Direction key, Power Button	7 x Programmeable Keys , Power Button, Reset Button	Power Button	Power Button
I/O Interface	USB	2 x USB 2.0 FULL SPEED	1 x Mini USB 1.1	2 x USB 2.0 FULL SPEED	4 x USB 2.0
	Serial	1 x DB9 OBD-II 1 x DB-9 RS-232/422/485 (Software selectable w/ 5V DC) 5V DC	1 x OBD-II 1 x RS232	1 x DB9 OBD-II 1 x DB-9 RS-232/422/485	1 x OBDII 6 x COM port: DB9 (COM1), RS-422/485 (COM4, 4-pin), DB37 (COM7~COM10)
	LAN	1 x 10/100/1000 Mbps GbE RJ-45	N/A	1 x 10/100/1000 Mbps GbE RJ-45	1 x 10/100/1000 Mbps GbE RJ-45
	VGA	N/A	N/A	1 x VGA	1 x VGA support up to 1920x1200
	CAN	N/A	N/A	1 x CAN-bus	N/A
	Remote Control	Yes	N/A	N/A	N/A
	Digital I/O	N/A	2 Input / 2 Output	4 Input / 4 Output	4 Input / 4 Output
	RJ12	N/A	N/A	N/A	1 X RJ11 3.5G Voice
	HDMI	N/A	N/A	N/A	1 x HDMI
Power	Cigarette Lighter Power	Cigarette Lighter Power Cable DC 9~30V	Cigarette Lighter Power Cable DC 9~30V	Cigarette Lighter Power Cable DC 9~30V	Cigarette Lighter Power Cable
	ACC Power	ACC power on/off mode with software configurable delay time	N/A	ACC power on/off mode with software configurable delay time	ACC power on/off mode with software configurable delay time
Environment	Operating Temperature	-20˚C to +60˚C	-20˚C to +70˚C	-20˚C to +70˚C	-20˚C to +70˚C
	Storage Temperature	-30˚C to +70˚C	-30˚C to +80˚C	-30˚C to +80˚C	-30˚C to +80˚C
	Humidity	5%~95% non-condensing	5%~95% non-condensing	5%~95% non-condensing	5%~95% non-condensing
	Drop Survival	1M	1M	N/A	N/A
	Environmental Protection	Front Panel IP 54 compliant (Water,dust and splash resistant)	Front Panel IP 54 compliant (Water,dust and splash resistant)	N/A	N/A
	Certification	CE/FCC/e-MARK/ISO7637	CE/FCC/e-MARK/ISO7637	CE/FCC/e-MARK/ISO7637	CE/FCC/e-MARK/ISO7637
Physical Characteristics	Dimensions (LxWxH) (mm)	261 x 162 x 44	128 x 89 x 32	200 x 155 x 70	200x 150x76
	Net Weight	1200g	177g	1978g	2015 g

iKarPC Vehicle Computer Series

- 8" TFT sunlight readable LCD touch screen
- Intel® Atom™ Z510 1.1 GHz processor
- Pre-installed Windows® XP Embedded
- Built-in HSUPA/GPRS/GSM, Wi-Fi and Bluetooth
- Built-in 32-channel GPS Receiver
- Supports On-Board Diagnostics (OBD)

COMPUTEX TAIPEI 2011 BC AWARD BEST CHOICE

OBD-II | 3.75G/ HSUPA | Bluetooth | Wi-Fi | Fanless | Operating Temperature | High Brightness | Touchscreen | Camera | intel Embedded Alliance

Diverse Connectivity

WWAN 2.5G/3.5G/3.75G

- Efficient mobile connectivity for GPS map download and high quality video/audio stream.
- Supports WCDMA/CDMA2000/TD-SCDMA

Supported Bands

- HSUPA/HSPA/UMTS-800/850/900/1900/2100 MHz
- Quad-band EDGE/GPRS/GSM-850/900/1800/1900 MHz
- Dual-band EV-DO/CDMA

GPS

Travel navigation, real-time locating and path tracking.

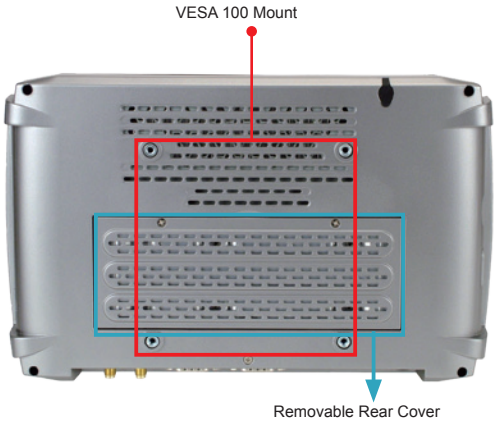
- 32-channel engine
- TTFF (Time to First Fix) < 1 sec for hot and aided starts
- -160dBm SuperSense sensitivity
- A-GPS service by accessing to assistance ephemeris data server via internet or mobile connectivity

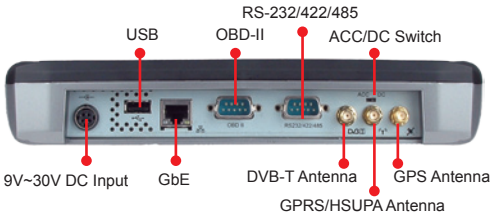
Bluetooth V2.0 + EDR Class 1

Efficient mobile connectivity for GPS map download and high quality video/audio stream.

802.11b/g Wi-Fi

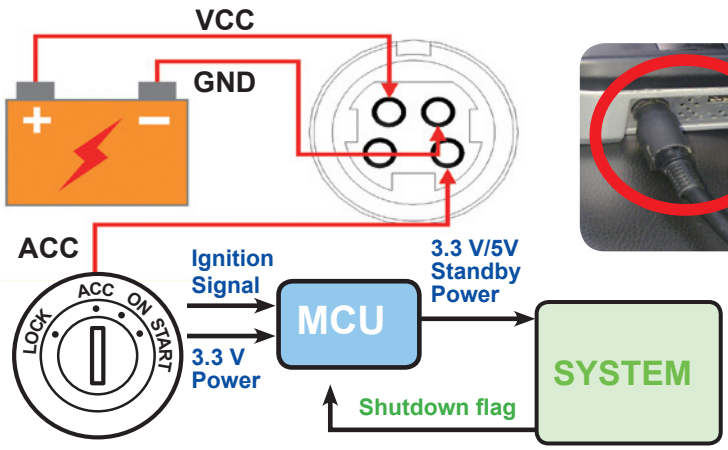
Best for near field data synchronization or ad-hoc communication when vehicle park in parking space or dock.





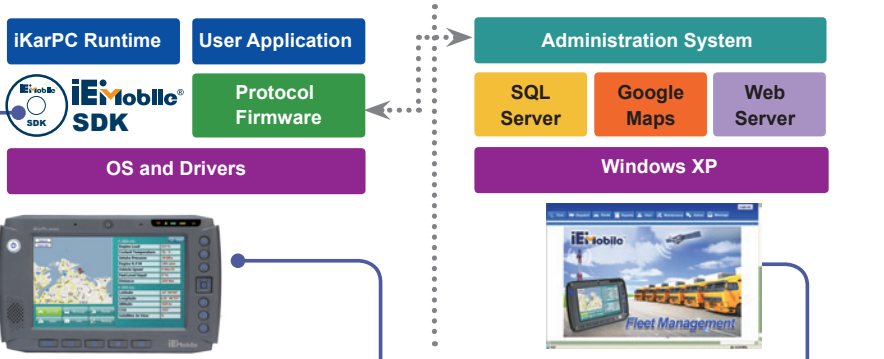
Infrared Remote Control

Vehicle Power Management



- The special MCU enables system to automatically reboot or shutdown based on the adjustable delay time by detecting ACC status.
- Surge protection and low power consumption hardware design

Turnkey Software



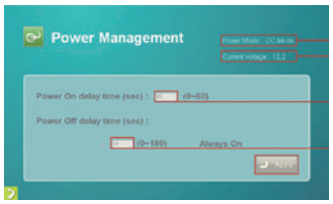
IEI iKarPC SDK
Allows third-paries to develop software for the iKarPC or to customize the Fleet Management

iKarPC Manager
Provides drivers the travel and job information from vehicle CAN-bus and GPS input.

Web-based Fleet Management System
Allows users to locate or track fleet, plan routes, manage job data and generate reports.

Setting

Use the Setting page to adjust the setting of audio volume, LCD brightness, power on/off delay time, embedded module and function keys.



Power Management

When the vehicle ignition switch is turned to ACC or ON state, the iKarPC will automatically turn on off after a certain time delay.

Module On/Off

Use the Module On/Off page to enable or disable the embedded modules, including Bluetooth, Wi-Fi, DVB-T, 3.75G connection and webcam.

Programmable Function Key

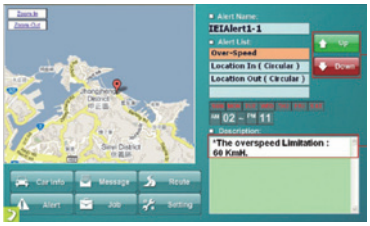
The iKarPC provides SDK for customers to define and program their own Function Keys.

Fleet Management Software

The Fleet Management is an advanced, end-to-end, web-based software for data collection and communication. It combines all the information from CAN-bus and GPS input in one easy-to-navigate interface. Pre-installed in the iKarPC, it is integrated with OBD-II or FMS/J1939 diagnose tool to provide a comprehensive remote performance monitoring envelope for vehicles.

Car Information

Show the vehicle information gathered through the OBD cable to the iKarPC and display the GPS information.

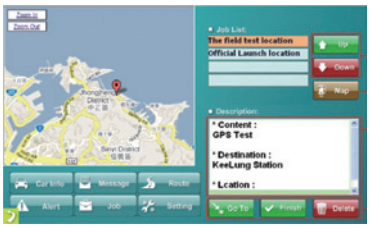


Alert

Click the Alert button to view the alerts from the management center.

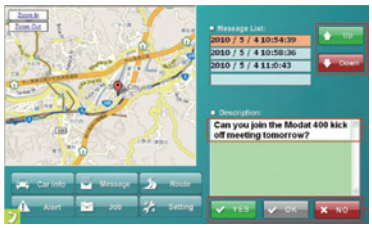
Route

View the route plan from the back-end management center.
Click the Map button to bring up the map of the route plan.
.



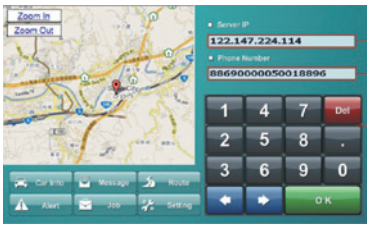
Job

Click the Job button to view the Job assignment from the management center.


Message List:
2010 / 5 / 4 10:54:39
2010 / 5 / 4 10:58:36
2010 / 5 / 4 11:0:43
Description:
Can you join the Modat 400 kick off meeting tomorrow?

Message

Show the messages from the back-end management center.
Use up and down buttons or click a message from the message list to view the message.



Setting

Use the Setting page to input the server IP address of the back-end management center to the iKarPC. The unique number of SIM card is used as the identification number of the iKarPC.

One Key Recovery

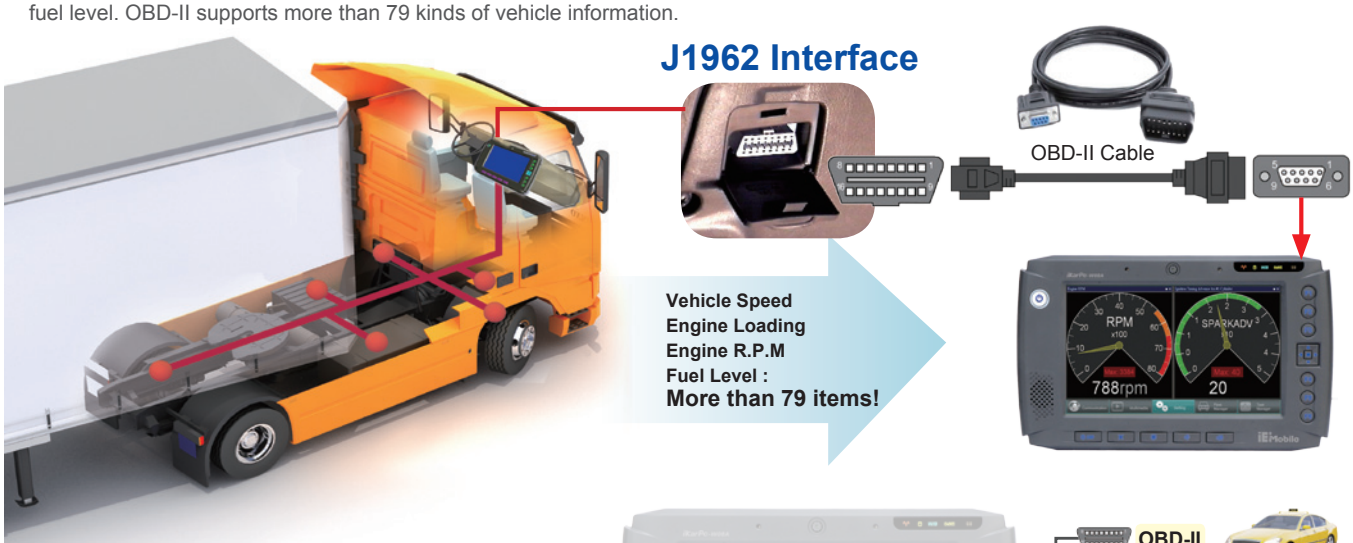
Without having to go through complicated settings, IEI One Key Recovery uses exclusive technology to recover and backup your system with just one click.

Recover the system from

- Severe virus attack
- Operating system crash
- Man-made disasters

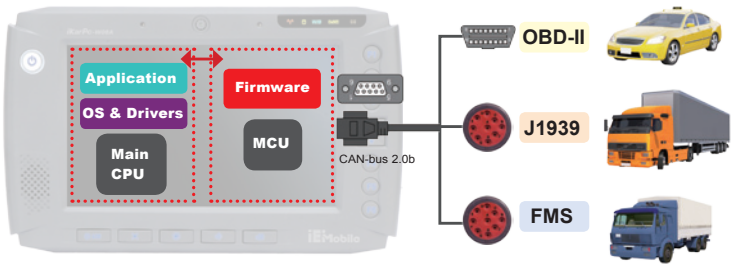
Vehicle Bus Protocol (OBD-II/J1939/FMS)

A vehicle bus protocol is a specialized internal communications network that interconnects components inside a vehicle. It also provides interface for users to acquire vehicle data for diagnostic or cruise information such as vehicle speed, engine loading, engine R.P.M and fuel level. OBD-II supports more than 79 kinds of vehicle information.



Physical Connection Interface

The vehicle bus connection is mostly based on CAN-bus 2.0b signaling via a specific connection interface. For example, OBD-II defines the J1962 female 16-pin (2x8) connector as its physical interface while J1939 defines the 9-pin round connector.



On-Board Diagnostics (OBD-II)

OBD-II is a standard that specifies the type of diagnostic connector and its pin-out, the electrical signaling protocols available, and the messaging format. There are five signalling protocols currently in use with the OBD-II interface. Any given vehicle will likely only implement one of the protocols. The iKarPC supports ISO 15765 CAN (250 kBit/s or 500 kBit/s). The CAN protocol is a popular standard outside of the US automotive industry and is making significant in-roads into the OBD-II market share. By 2008, all vehicles sold in the US are required to implement CAN, thus eliminating the ambiguity of the existing five signaling protocols. The CAN signals are via pin-6 and pin-14 of the OBD-II connector.

Pin	Description
1	-
2	Bus positive Line of SAE-J1850 PWM and SAE-1850 VPW
3	-
4	-
5	-
6	CAN high (ISO 15765-4 and SAE-J2284)
7	K line of ISO 9141-2 and ISO 14230-4
8	-
9	-
10	Bus negative Line of SAE-J1850 PWM only (not SAE-1850 VPW)
11	-
12	-
13	-
14	CAN low (ISO 15765-4 and SAE-J2284)
15	L line of ISO 9141-2 and ISO 14230-4
16	-

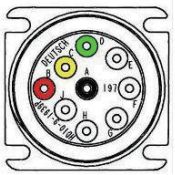
OBD-II/J1939/FMS Vehicle Bus Protocol

The vehicle bus protocol deals with special request for data transmission reliability and quality on vehicle bus. The MCU inside the iKarPC acts as a converter among these protocols. IEIMobile currently supports three major vehicle bus protocols: OBD-II, J1939 and FMS. The OBD-II is mostly for small car diagnostics while the SAE J1939 is implemented for off-road vehicles with diesel engines and the FMS is for commercial trucks or buses.

SAE J1939

- SAE J1939 has been adopted widely by diesel engines. Applications of J1939 now include off-highway, truck, bus, and even some passenger car applications.
- SAE J1939 defines five layers in the 7-layer OSI network model, and this includes the CAN 2.0b specification (using only the 29-bit/"extended" identifier) for the physical and data-link layers. The session and presentation layers are not part of the specification.
- All J1939 packets contain eight bytes of data and a standard header which contains an index called PGN (Parameter Group Number). J1939 defines standard PGNs to encompass a wide range of automotive, agricultural, construction, marine and off-road vehicle purposes.
- iKarPC supports SAE J1939 and provides a SAE J1939 connector.

A GND
B Power
C CAN-H
D CAN-L



Applications

IPCAM Applications

IP camera is a type of digital video camera commonly employed for surveillance. Unlike analog closed-circuit television (CCTV) cameras, it can send and receive data via a computer network and the Internet.

iKarPC can monitor and record vehicle status through IPCAM.

OBD-II Applications

Auto Service

Car Racing

Rental & Insurance

Fleet Management

SAE J1939 Applications

Off-Road

Marine

Construction

Bus & Truck

Diesel Engine

Agricultural

Certification

Vibration Test

Follow MIL-STD-810F 514.5C-1

	Operating Random Vibration Mode	Non-Operating Sine Mode
Rules	(MIL-STD-810F 514.5C-1)	IEC-60068-2-06
	Axis: 3 axes / Vertical / Transverse / Longitudinal. 10-500 Hz, 60min/axis	Axis: 3 axes / Vertical / Transverse / Longitudinal .2. 0.4in. p-p, 10-55Hz

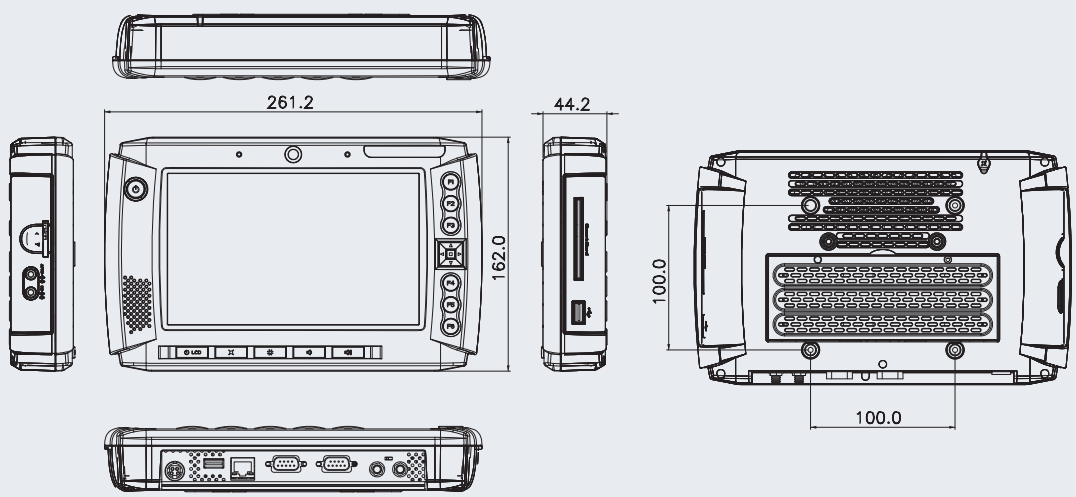
Shock Test

Reference IEC68-2-27 Testing Procedures

	Operating	Non-Operating
Rules	Operating Shock Half-Sine Wave Shock	Non-Operating Shock Half-Sine Wave Shock
	Acceleration 5 G	Acceleration 15 G

iKarPC for MeeGo

- Besides Windows® XP or Windows® 7, iKarPC provides an optional model powered by MeeGo IVI.
- The MeeGo IVI software platform is designed to enable rich Internet and multimedia consumer experiences for vehicles. MeeGo IVI builds on the foundation laid by Moblin IVI for rich multimedia, CE device management, Internet, and automotive connectivity.
- This MeeGo version of iKarPC is with pre-installed MeeGo IVI platform, along with default standard MeeGo IVI UI (user interfaces) customized by IEIMobile to provide all specific iKarPC features and bundled SDK (Software Development Kits).
- Like all MeeGo devices, iKarPC users can use standard MeeGo API, which is based on Qt and Qt Mobility, to develop MeeGo application software for iKarPC.



Specifications

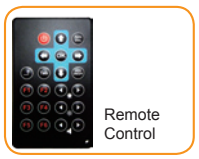
Model	iKarPC	
Display	LCD Size	8" TFT-LCD (Sunlight readable)
	Brightness (cd/m²)	600 cd/m² High Brightness
	Max Resolution	800 x 480 pixels WVGA
	Viewing Angle	60/60/50/50 Deg.
	Touch Screen	5-wire resistive type touch
System	CPU	Intel® Atom™ Z510 1.1 GHz
	Chipset	Intel® US15WP
	Operating System	Microsoft® Windows® XP Embedded
	Memory	1 GB DDR2 533 MHz On-board
	Storage	4 GB CompactFlash® SD Card Slot
Communication	Wireless LAN	Wi-Fi 802.11 b/g/n
	Bluetooth	Bluetooth V2.0+ EDR (Class 1)
	Modem	WCDMA/HSUPA
	GPS	GPS
Multimedia	Audio	1 x Line-in 1 x Line-out 1 x 3 W Speaker
	Camera	0.3 megapixels CMOS Camera
LED Indicators & Buttons	Indicators	Wi-Fi/Bluetooth/HDD/3.75G/DVB-T/Power Status LED
	Hot Key & Buttons	F1~F6 Function Key, Direction Key, Power Button
I/O Interface	USB	2 x USB 2.0
	Serial	1 x DB-9 OBD-II 1 x DB-9 RS-232/422/485 (Software selectable w/ 5V DC)
	LAN	1 x 10/100/1000 Mbps GbE RJ-45
Power	Cigarette Lighter Power	Cigarette Lighter Power Cable DC 9~30V
	ACC Power	Manual power mode and ignition detection supported ACC power on/off mode with software configurable delay time
Environment	Operating Temperature	-20˚C ~ +60˚C
	Storage Temperature	-30˚C ~ +70˚C
	Humidity	5%~95% non-condensing
	Drop Survival	1 M
	Environmental Protection	IP54 compliant front panel (Water, dust and splash resistant)
	Certification	CE/FCC/e-Mark/ISO7637
Physical Characteristics	Dimensions (LxWxH) (mm)	261 x 162 x 44
	Net Weight	1730 g

Ordering Information

Part Number	Description
IKARPC-W08A-510-HU-MG-R11	8.0" TFT-LCD 600 cd/m² WVGA In Vehicle PC with Intel® Atom™ Z510 1.1GHz CPU, 1GB SDRAM, 802.11 b/g Wireless, Bluetooth, HSUPA,OBD-II, Touch screen, 0.3 Megapixel Camera, MeeGo OS, 4 GB CF, RoHS
IKARPC-W08A-510-HU-R11	8.0" TFT-LCD 600 cd/m² WVGA In Vehicle PC with Intel® Atom™ Z510 1.1GHz CPU, 1GB SDRAM, 802.11 b/g Wireless, Bluetooth, HSUPA, OBD-II, Touch screen, 0.3 Megapixel Camera, XPE OS and 4GB CF, RoHS
IKARPC-W08A-510-HW-R11	8.0" TFT-LCD 600 cd/m² WVGA In Vehicle PC with Intel® Atom™ Z510 1.1GHz CPU, 1GB SDRAM, 802.11 b/g Wireless, Bluetooth, HUAWEI HSUPA, OBD-II, Touch screen, 0.3 Megapixel Camera, XPE OS and 4GB CF, RoHS

Packing List

Item	Part Number	Q'ty
Remote Controller	7Z000-8T00322ICP06G-RS	1
GPS/3.75G Integrate Antenna	32506-000100-100-RS	1
ACC Power Cable	32002-000901-100-RS	1
Cigarette Lighter Power Cable	32002-001700-100-RS	1
OBD-II Cable	32025-000300-100-RS	1
J1939 Cable	32025-000400-100-RS	1
Uesr's Manual CD-ROM	IEI-7B000-000544-RS	1
IEI One Key Recovery CD	IEI-7B000-000478-RS	1


Remote Control

OBD-II Cable

ACC Power Cable

GPS / 3.75G Integrate Antenna

Cigarette Lighter Power Cable

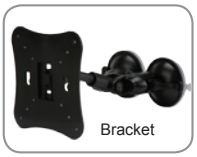
J1939 Cable

Optional Accessory List

Item	Part Number	Description
Power Adapter	63000-FSP060DBAB1554-RS	Power Adaptert, PFC; Vin:90~264VAC; 60W; Vout: 12VDC; Din 4Pin/lock; CCL; RoHS
Bracket	iKarPC-W08A-MK01-R10	iKarPC 100 x 100 VESA mount kit
Bracket	iKarPC-W08A-MK02-R10	iKarPC ram-mount 100 x 100 VESA mount kit

Ram Mount

Power Adapter


Bracket

Support Function

Part Number	Wireless	Bluetooth	GPS	3.75G	OS
iKarPC-W08A-510-HU-MG-R11	802.11 b/g/n	V2.0+EDR, Class 1	U-blox	Qualcomm	MeeGo
iKarPC-W08A-510-HU-R11	802.11 b/g/n	V2.0+EDR, Class 1	U-blox	Qualcomm	XPE
iKarPC-W08A-510-HW-R11	802.11 b/g/n	V2.0+EDR, Class 1	U-blox	HUAWEI	XPE

VTT-1000

Vehicle Tracking Terminal

- 3.5” TFT LCD touch screen
- Embedded with ARM9 400MHz CPU
- Pre-installed Windows® CE 6.0
- Built-in GSM/GPRS and antenna
- SiRF Star III 20-channel GPS receiver
- Supports On-Board Diagnostics (OBD)

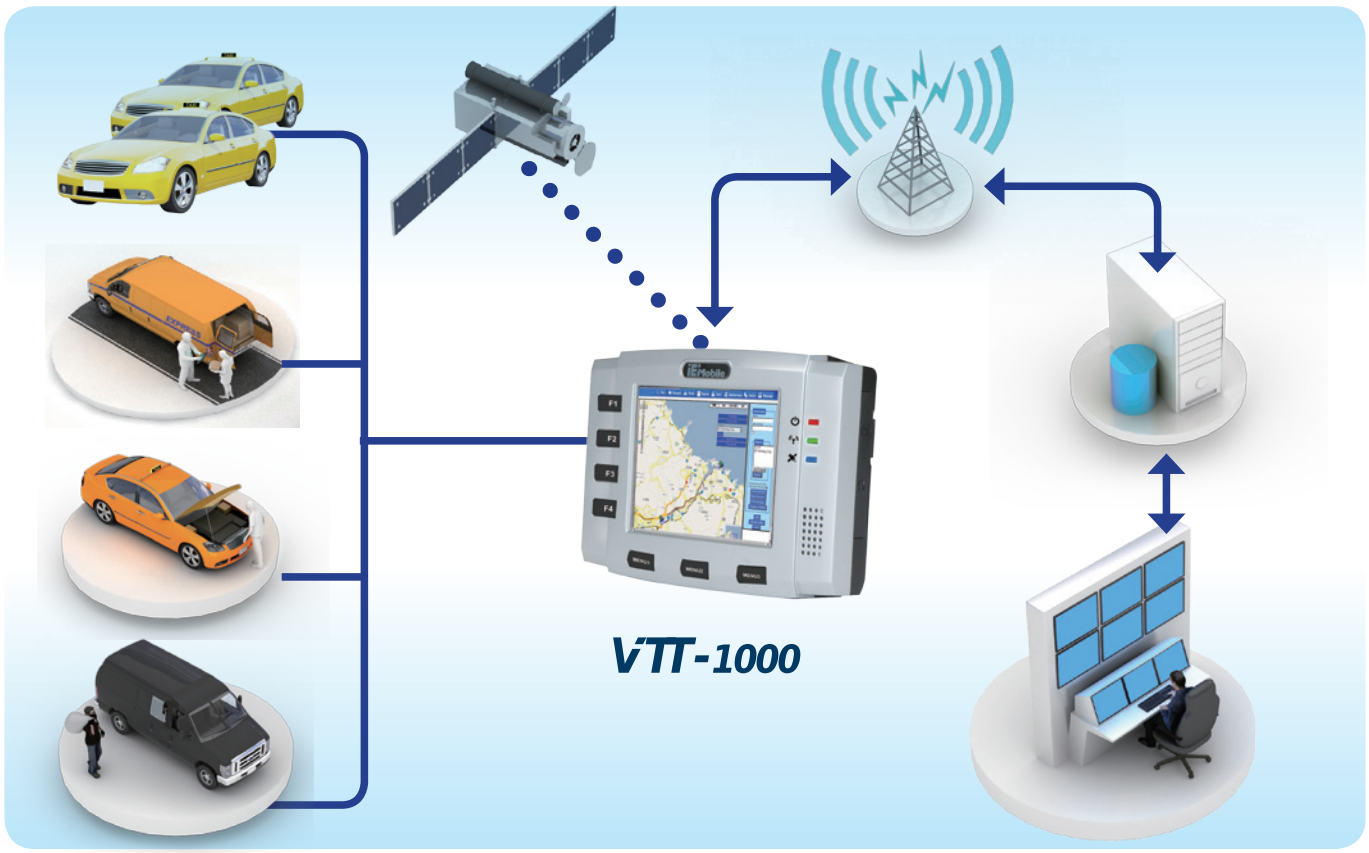
ARM

Windows CE.net

GPRS | Touch screen | GPS | OBD-II | microSD | Fanless

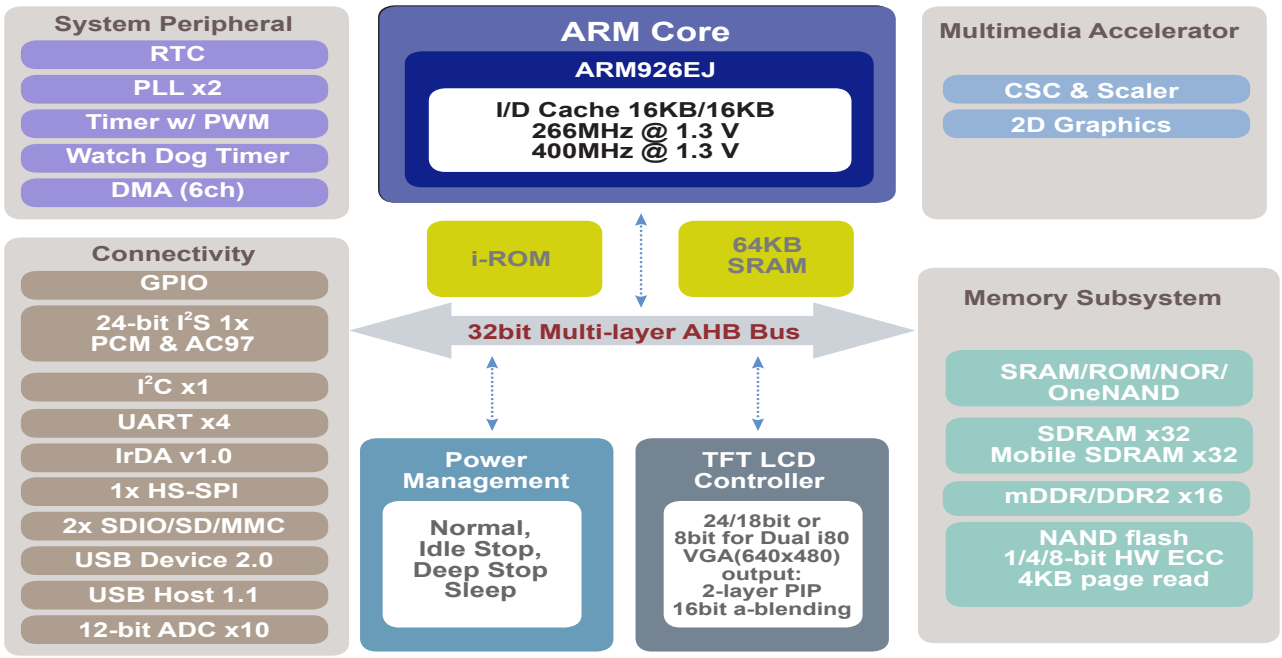
Applications

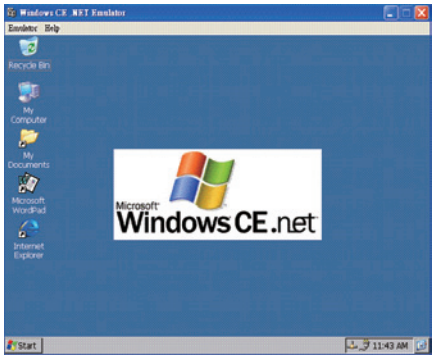
- Fleet Management System
- In-Vehicle Infotainment
- Location-Based Services
- Real-time Vehicle Diagnostic
- Emergency and Security Services



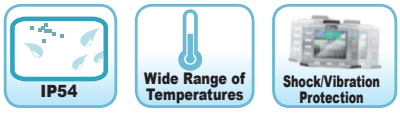
Compact, Rugged, High Performance, and Low Power Consumption

- ARM926EJ core with built-in 2D graphics accelerator





- Pre-installed Windows® CE 6.0 R3
- Waterproof Front Panel LCD Display
- IP54 Compliant Dustproof Housing
- -20°C ~ 70°C Wide Operating Temperature
- Shock and Vibration Protection in Vehicle Environment



Global Positioning System (GPS) Receiver

Specifications	
Chipset	SiRF Star III, GSC3f/LPx (Digital, RF in a single package)
Frequency	L1, 1575.42 MHz
Channels	20 parallel
C/A Code	1023 MHz
Chipset TTFF	Reacquisition: Less than 1s Hot start: Less than 1s @ open sky Warm start: Less than 35s @ open sky Cold start: Less than 35s @ open sky
Accuracy	Position: Within 10m for 90% Velocity: 0.1m/s
Interface Protocol	1. NMEA 0183 ver 3.0, GGA, GSA, GSV, RMC, 4800bps 2. SiRF Protocol 57600bps, 8 data bits, no parity, 1 stop bits
LNA	15dB Gain.(Typ.) LNA only enable by LPX series
Internal Memory	Flash type on 4MB
TCXO	16.369 MHz
Trickle Power Mode	Duty cycle ≦ 34%. (Variable) Default: Disable (Option: Enable)

SiRF®

GSM/GPRS Telecommunication

VTT-1000 is equipped with a Cinterion (formerly Siemens) MC55i wireless module and built-in antenna for machine-to-machine (M2M) communication over GPRS. The MC55i is awarded full type approval and certified by global carriers and operators. It is optimized with quad-band technology for worldwide roaming.

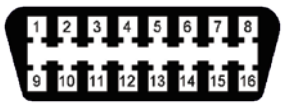
- Quad-Band GSM 850/900/1800/1900 MHz
- GPRS multi-slot class 10
- GSM phase 2/2+ compliant
- TCP/IP stack access via AT commands
- Internet Services: TCP, UDP, HTTP, FTP, SMTP, POP3
- Control via AT commands
  (Hayes 3GPP TS 27.007, TS 27.005)
- SIM Application Toolkit
- Specification for GPRS data transmission:
  - GPRS class 10: max. 86 kbps (DL)
  - Mobile station class B
  - PBCCH support
  - Coding schemes CS 1-4

In-Vehicle Communication

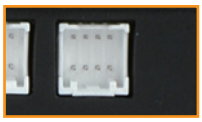
- Almost all of the automobiles produced today are required by law to provide an interface for connecting the diagnostic test equipment. The VTT-1000 provides a connection to vehicle On-Board Diagnostics (OBD) port (OBD-II connector) and supports the most common data transfer protocols and standards in use today.

Protocols and Standards

SAE J1850 PWM (41.6 kbaud)
SAE J1850 VPW (10.4 kbaud)
ISO 9141-2 (5 baud init)
ISO 14230-4 KWP (5 baud init)
ISO 14230-4 KWP (fast init)
ISO 15765-4 CAN (11-bit ID, 500 kbaud)
ISO 15765-4 CAN (29-bit ID, 500 kbaud)
ISO 15765-4 CAN (11-bit ID, 250 kbaud)
ISO 15765-4 CAN (29-bit ID, 250 kbaud)
SAE J1939 CAN (29-bit ID, 250* kbaud)



OBD-II Connector



VTT-1000 connector

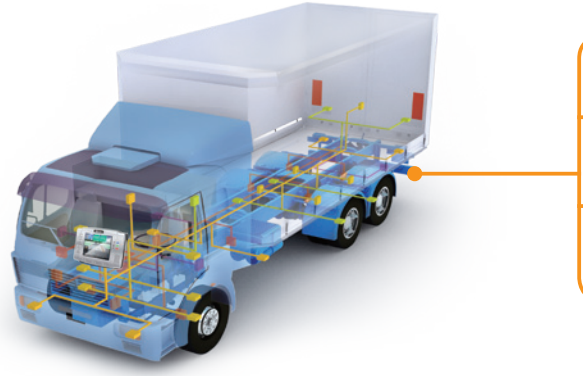
Supported OBD-II Connector Pins

OBD-II Pin	Description
1	-
2	Bus positive line of SAE-J1850 PWM and SAE-1850 VPW
3	-
4	-
5	-
6	CAN high (ISO 15765-4 and SAE-J2284)
7	K line of ISO 9141-2 and ISO 14230-4
8	-
9	-
10	Bus negative line of SAE-J1850 PWM only (not SAE-1850 VPW)
11	-
12	-
13	-
14	CAN low (ISO 15765-4 and SAE-J2284)
15	Line of ISO 9141-2 and ISO 14230-4
16	-

- In addition to traditional applications for diagnostic trouble code readers and automotive scan tools, emerging applications such as Location-based Services (LBS) and Fleet Management System (FMS) have started to combine OBD with GPS and telecommunication technology, making remote real-time diagnostics available.

Built-in Sensors and I/O

VTT-1000 includes built-in temperature sensor, G-sensor, E-compass, and digital I/O to provide advanced vehicle monitoring and control applications. For example:



- Alarm, light and sound supplier whichautomatically checks for unusual tags.
- An automatic emergency call will be initiated when airbag deployment is detected.
- When the G-Sensor detects a sudden brake or acceleration, system begins to log critical vehicle data, navigation data, and real-time picture or video.
- Real-time navigation and position logging.

Software Development Kits (SDK) and Built-in Software

- In addition to Windows CE SDK, the VTT-1000 SDK contains easy to use API's for application software development
  - **Detect function key status (F1 ~ F4, and Menu1 ~ Menu3) and to program user interface applications**
  - **Digital I/O offers an easy to use 4-bit digital I/O (2 inputs/2 outputs) configuration. Allows you to set digital outputs and read digital inputs**
  - **Read temperature sensor data to monitor vehicle ambient temperature**
  - **Read G-sensor data to monitor vehicle status**
  - **Read E-compass data to log or display directions**
  - **Open OBD-II port and read OBD-II PIDs (P-codes)**

OBD-II PIDs are defined by SAE J1979. The expected response for each PID is given along with information on how to translate the response into meaningful data. Information includes:

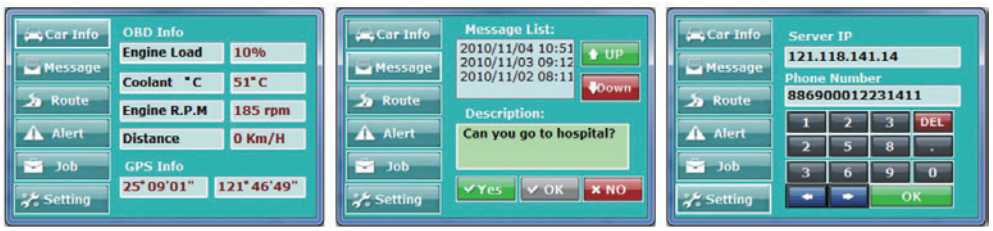
- •Vehicle speed
- •Engine RPM
- •Total fuel used (litre since life time)
- •High resolution vehicle distance
- •Engine coolant temperature
- •Vehicle ambient temperature
- •Tachograph information
- •Total engine hours (h)
- •Fuel level (0–100 %)
- •Fuel pressure
- •Fuel system status
- •DTC (Diagnostic Trouble Code)
- •Calculated engine load
- •Intake air temperature
- •Throttle position
- •Accelerator pedal position (0–100 %)
- •Axle weight (kg)
- •Oxygen sensors and status
- •Clutch switch (on/off)
- •Brake switch (on/off)
- •Cruise control (on/off)
- •PTO (Status/Mode)

- The VTT-1000 SDK also provides free fleet management demo software, IEI FMS. This software is based on client/ server architecture. Server-side software is contained in the bundled CD and can be installed in a Windows® desktop PC. Client-side software (VTT-1000 Runtime) is pre-installed in each VTT-1000. IEI FMS demonstrates the most basic function of fleet management software with the ability to gather, store, process, monitor, report on and export information.

IEI FMS Architecture

■ Server-side Screen Shot

■ Client-side Screen Shot

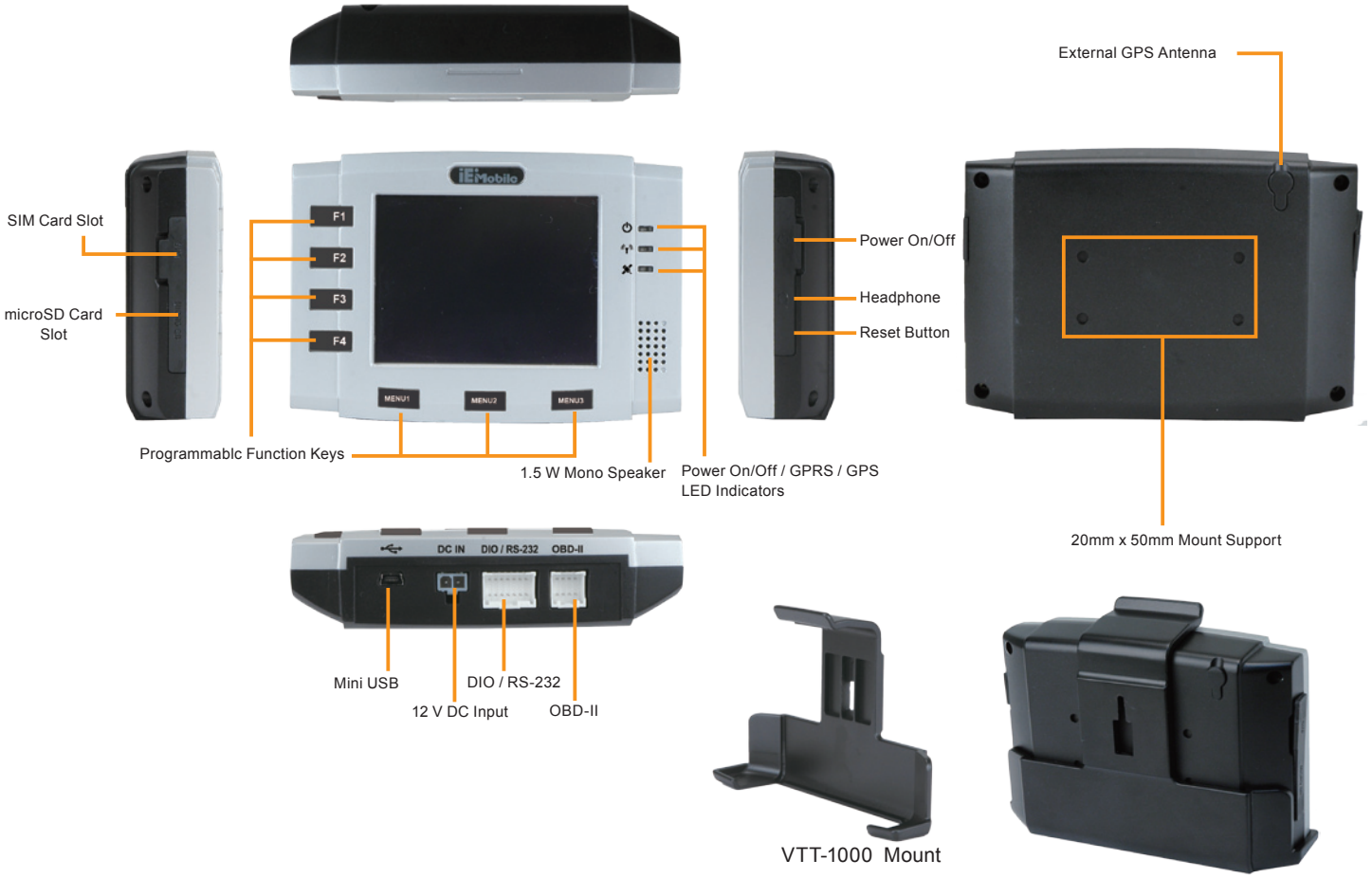


OEM Built-in Optional 3rd Party Navigation Software

(May Require MOQ and NRE Depending On Project Base)

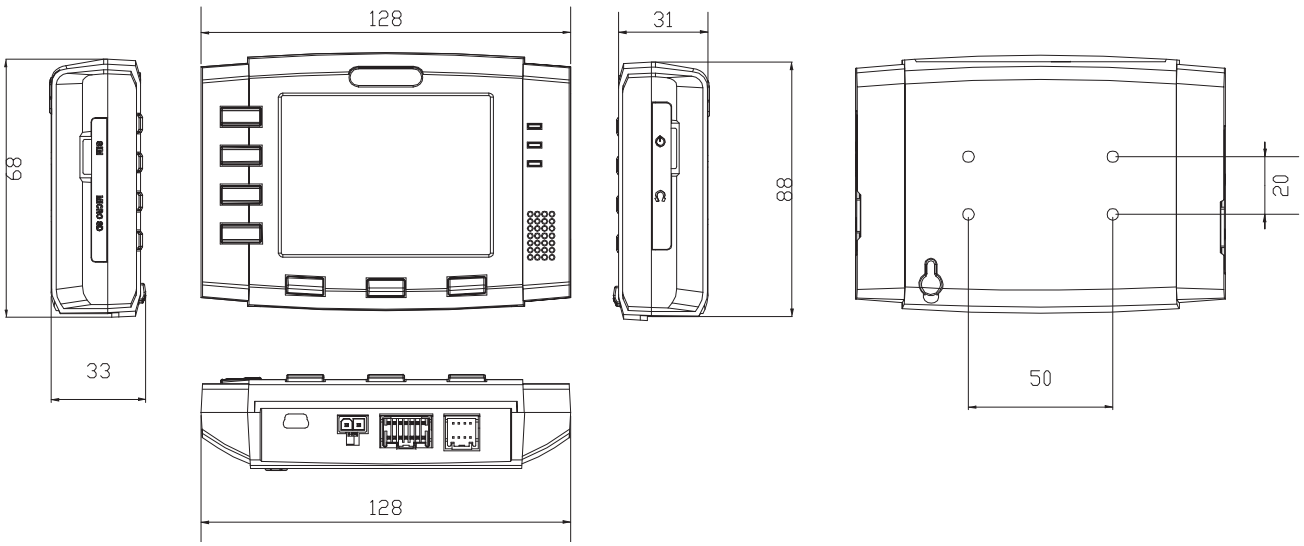
Tailoring to your specific needs, VTT-1000 supports a diverse array of popular Navigation softwares currently on the market, such as Lingtu for China.

■ **Lingtu** With map of China



VTT-1000

Dimensions (Unit : mm)



Specifications

Model	VTT-1000	
Display	LCD Size	3.5" TFT-LCD
	Brightness (cd/m²)	450 cd/m²
	Max Resolution	320 x 240 Pixels QVGA
	Viewing Angle	50/55/60/60 Deg.
	Touch Screen	4-Wire Resistive Type Touch
System	CPU	Samsung® S3C2416 ARM9 400 MHz
	Operaing System	Microsoft® Windows® CE 6.0
	Memory	128 MB DDR2 133 MHz On-board
	Storage	256 MB NAND FLASH microSD Card Slot
	Modem	GSM/GPRS
	GPS	GPS w/Internal Antenna
Multimedia	Audio	1 x Line-out 1 x 1.5 W Speaker
LED Indicators & Buttons	Indicators	Power/2.5G/GPS Status LED
	Hot Key	7 x Programmeable Keys, Power Button, Reset Button
I/O Interface	USB	1 x Mini USB1.1
	Serial	1 x OBD-II 1 x RS-232
	Digital I/O	2 Inputs / 2 Outputs
Power	Cigarette Lighter Power	Cigarette Lighter Power Cable DC 9~30V
Environment	Operating Temperature	-20˚C ~ +70˚C
	Storage Temperature	-30˚C ~ +80˚C
	Humidity	5%~95% Non-Condensing
	Drop Survival	1 M
	Environmental Protection	IP 54 (Water, dust and splash resistant)
	Certification	CE/FCC/e-MARK
Physical Characteristics	Dimensions (LxWxH) (mm)	128 x 89 x 32
	Net Weight	177 g

Ordering Information

Part Number	Description
VTT-1000-T35A/128MB-00-R10	3.5" 450cd/m² QVGA fanless Vehicle Computer with ARM S3C2416X40-Y640 400MHz CPU, 128MB SDRAM, GSM/GPRS, OBD-II, GPS, without AC Adapter, RoHS

Packing List

Item	Part Number	Q'ty
DIO / RS-232 Integrate Cable	32016-000300-100-RS	1
OBD-II Cable	32016-000400-100-RS	1
GPS Antenna	32502-000200-100-RS	1
Cigarette Lighter Power Cable	32002-003300-100-RS	1
Uesr's Manual CD-ROM	7B000-000569-RS	1

Optional Accessory List

Item	Part Number	Description
Bracket	VTT-1000-MT01-R10	VTT-1000 Mount kit
AC Adapter	63040-010018-000-RS	Adapter Power; FSP; FSP018-DEDE1; Active PFC; Vin:90~264VAC;18W; Cable=1800mm; Vout:12VDC; RoHS

GPS Antenna

OBD-II Cable

DIO / RS-232 Integrate Cable

Cigarette Lighter Power Cable

Bracket

AC Adapter

AVL-2000PLUS

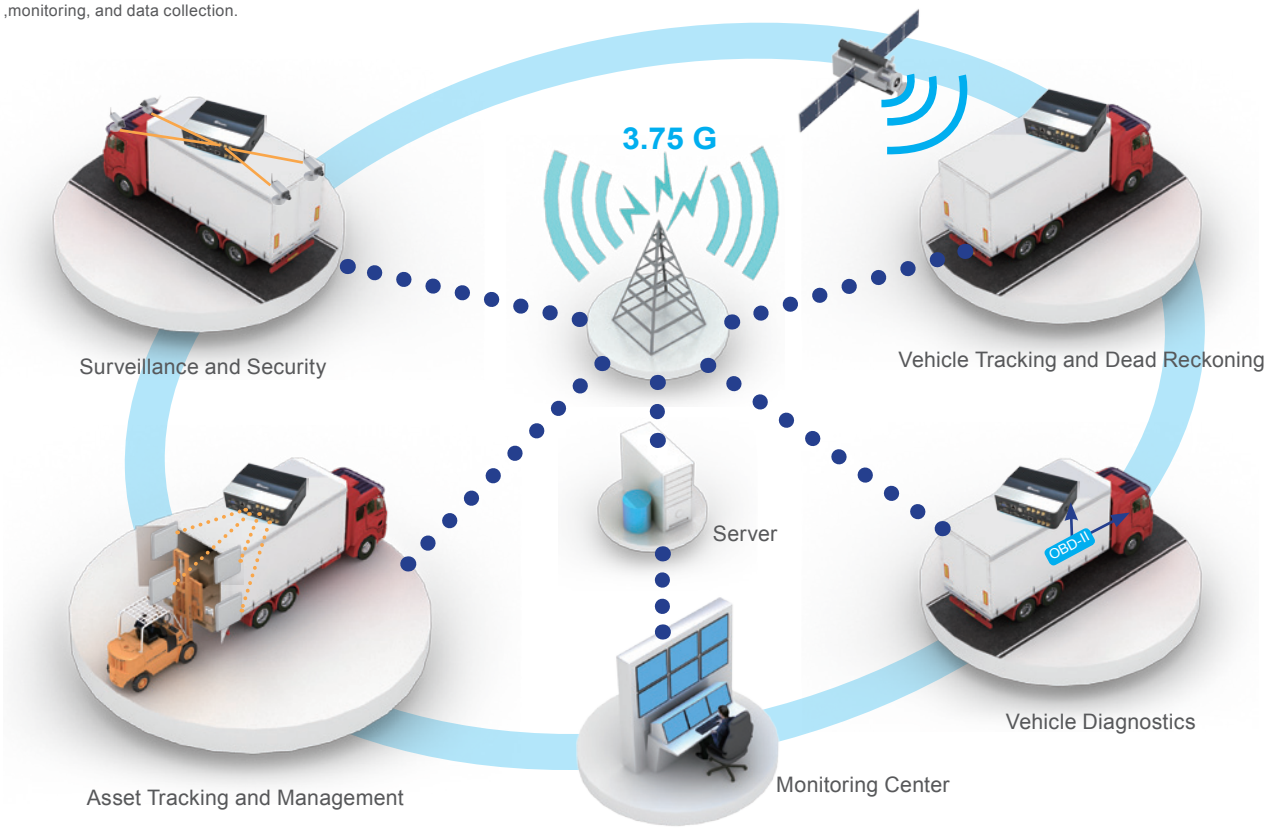
Auto Data Server

- Intel® Atom™ Z510 1.1GHz Processor
- Pre-installed Windows® XP Embedded
- Built-in HSUPA/GPRS/GSM and Wi-Fi
- Built-in GPS with Dead Reckoning Support
- Built-in VGA Port Output and NTSC/PAL/SECAM Video Capture NTSC: 120fps@ D1
  PAL/SECAM: 100fps@ D1 for Display
- Optional UHF RFID Reader Module
- Supports On-Board Diagnostics (OBD)

3.75G/ HSUPA | Wi-Fi | GPS | Dead Reckoning | Power Management | RFID | Windows xp

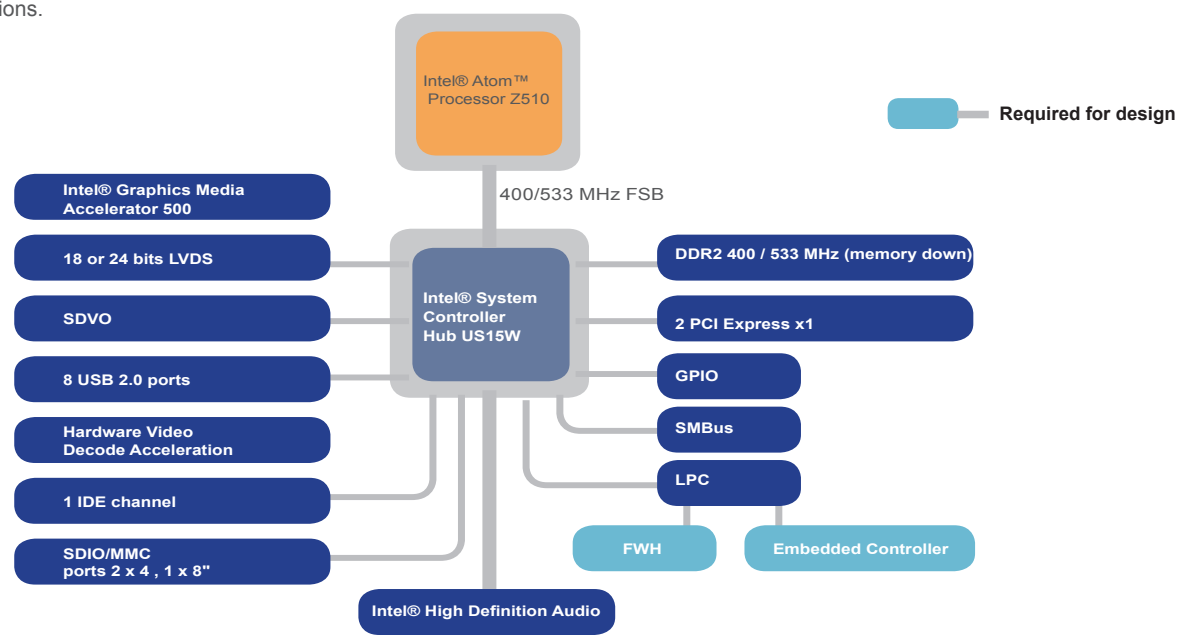
Advanced Vehicle Tracking/Monitoring with Auto Data Server

The AVL-2000PLUS comes integrated with a remote on-line and real time diagnostic system for vehicles via HSUPA/GPRS/GSM, Global Position System(GPS) and On-Board Diagnostic System(OBD) technologies. The compact design of the AVL-2000PLUS makes it easy to track goods or vehicles at any location and at anytime. The AVL-2000PLUS also provides video/audio capture and recording functions. Optional functions include UHF RFID Readers for a wide range of industrial and commercial applications, including supply chain management, asset tracking, authentication and access control. These complete advanced functions make an Auto Data Server suitable for accurate vehicle tracking, security ,monitoring, and data collection.



Low Power Consumption and High Performance with Intel® Atom™ Z510 Processor

- The AVL-2000PLUS features an Intel® Atom™ Z510 processor and Intel® System Controller Hub US15WP for embedded lifecycle support. The combination of high performance, low power consumption and integrated graphics/video makes this platform well suited for many embedded market segments such as in-vehicle infotainment, industrial control and automation, diagnostics and retail transaction solutions.



- Supporting Window® XP operating systems in a componentized form allows developers to create advanced commercial and consumer devices.

  IEIMobile supports MeeGo. MeeGo is a combined effort between Intel®, the world's largest chip manufacturer, and Nokia, the world's largest mobile handset manufacturer. It is a Linux-based open source platform designed from the ground up to provide cross-device support.

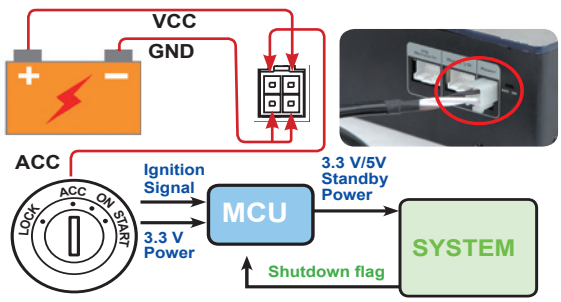
  MeeGo API is based on Qt and Qt Mobility. Qt, a well established tool for developers, allows MeeGo to offer its unique advantage of portability and expandability.

Microsoft Windows xp

MeeGo

Wide Temperature Range and Compact, Rugged Design

- -20°C ~ 70°C Operating Temperature
- Shock and vibration protection ideal in vehicle environments



Vehicle Power Management

- The unique MCU enables system to automatically reboot or shutdown based on the adjustable delay time by detecting ACC status
- Surge protection and low power consumption hardware design

One Key Recovery

Without having to go through complicated settings, IEI One Key Recovery uses exclusive technology to recover and backup your system with just one click.

Recover your system from
- Severe virus attack
- Operating system crash
- Man-made disasters

Built-in Global Positioning System (GPS) with Dead Reckoning Support

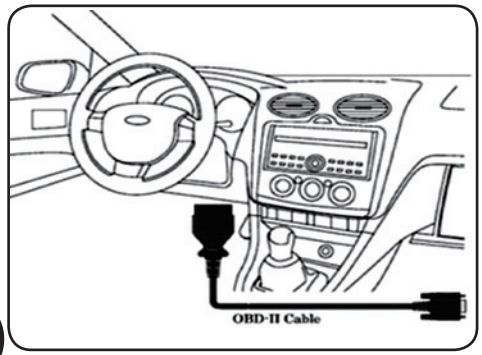
Dead-Reckoning (DR) is a new feature implemented in some high-end automotive navigation systems in order to compensate for the limitations of GPS technology. The solution ensures uninterrupted navigation and tracking when satellite signals are blocked or unavailable, such as near tall buildings, mountains, canyons, in tunnels or in underground parking. With Dead Reckoning, the AVL-2000PLUS can still provide continuous position reporting even during GPS satellite blockage.

Armored Money Truck

Hazardous Material Handling

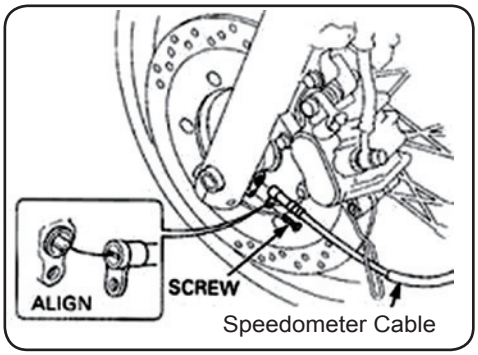
A built-in gyroscope is used to measure angular velocity. It provides highly accurate results when measuring an angular turn in any direction. The OBD-II, on the other hand, can accurately measure the speed of the vehicle. By combining gyroscopes with OBD-II, the AVL-2000PLUS is able to perform non-stop calculation of the dead reckoning position, orientation, and velocity (direction and speed of movement) of a moving object without any external references. It also eliminates the trouble and cost of a traditional speedometer cable installation. The AVL-2000PLUS is an ideal choice to enhance GPS performance and improve overall tracking ability.

AVL-2000PLUS uses standard OBD-II interface plug, allowing for quick and easy access to cruise data.



Simple "Plug-and-Play"

Traditional data retrieval via wired speedometer is cumbersome and time-consuming.



Hard to Install

Leading the Wireless Revolution

WWAN 2.5G/3.5G/3.75G

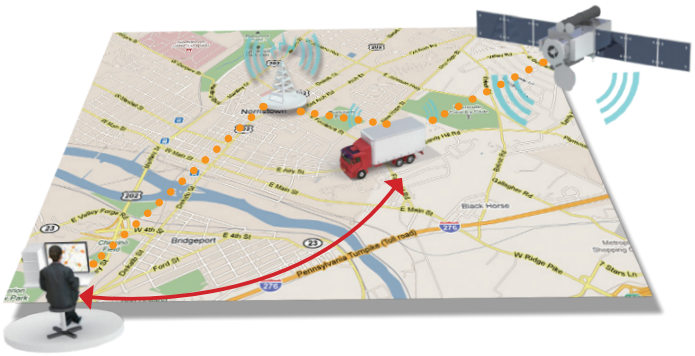
- Receive the localization coordinate of each vehicle through efficient mobile connectivity.

Technology/Bands

- HSUPA/HSPA/UMTS-800/850/900/1900/2100 MHz
- Quad-band EDGE/GPRS/GSM-850/900/1800/1900 MHz
- Dual-band EV-DO/CDMA-800/1900 MHz

802.11b/g Wi-Fi

- Delivers broadband-speed browsing and connectivity, compared to traditional wired LAN connections. Best for near field or ad-hoc data communications.



Extended Connectivity

Multi-Channel Real Time Video and Audio Capture Applications

- On-board video surveillance made easy with the AVL-2000PLUS. With multi-channel real time video and audio capture capabilities, it's designed to meet the requirements of modern security systems, especially in the transportation industry. It reduces loss and damage to goods and assets and increases the safety of the drivers. The AVL-2000PLUS SDK contains a library of four active channels video demo program, allowing for quick and easy customization of audio/video preview and capture application.

Key Features

- Internal 4-channel video decoder and audio ADC
- High quality proprietary fast video locking system for non-real-time application
- Supports 4-channel D1 video plus 1-channel audio simultaneously with independent channel control
- Dynamic synchronization: video processing; multiple video format output support Y422, Y420, IYUI/Y411, Y41P, RGB555 and RGB565
- Dual support for Direct Show and Direct Draw
- Accepts all NTSC(M/N/4.43) / PAL(B/D/G/H/I/ K/L/M/N/60) / SECAM standards with auto detection

PC-Style Peripherals

- 3-in-1 RS-232/422/485 serial interface

The AVL-2000PLUS is a ideal choice for connecting RS-232/422/485 serial devices to an Ethernet network, making it possible for software to access serial devices anywhere on a local network.

- Full speed USB 2.0 host

Supports connection to USB devices such as standard HIDs (Human Interface Device) like keyboard and mouse, USB storage, USB card reader, or proprietary USB devices.

- 10/100/1000 Mbps Ethernet LAN

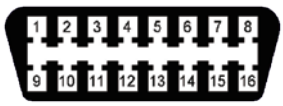
Wherever Ethernet LAN is available, the AVL-2000PLUS LAN port provides another faster and more efficient networking option.

In-Vehicle Communication

●Almost all of the automobiles produced today are required by law to provide an interface for the connection of diagnostic test equipment. The AVL-2000PLUS provides a connection to the vehicle's On-Board Diagnostics (OBD) port (OBD-II connector), and supports several popular data transfer protocols and standards.

Protocols and Standards

SAE J1850 PWM (41.6 kbaud)
SAE J1850 VPW (10.4 kbaud)
ISO 9141-2 (5 baud init)
ISO 14230-4 KWP (5 baud init)
ISO 14230-4 KWP (fast init)
ISO 15765-4 CAN (11-bit ID,500 kbaud)
ISO 15765-4 CAN (29-bit ID,500 kbaud)
ISO 15765-4 CAN (11-bit ID,250 kbaud)
ISO 15765-4 CAN (29-bit ID,250 kbaud)
SAE J1939 CAN (29-bit ID,250* kbaud)



OBD-II Connector

AVL-2000PLUS Connector

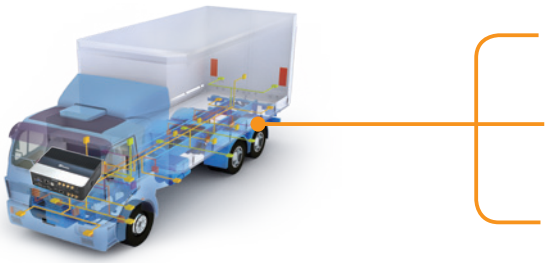
Supported OBD-II Connector Pins

OBD-II Pin	Description
1	-
2	Bus positive Line of SAE-J1850 PWM and SAE-1850 VPW
3	-
4	-
5	-
6	CAN high (ISO 15765-4 and SAE-J2284)
7	K line of ISO 9141-2 and ISO 14230-4
8	-
9	-
10	Bus negative Line of SAE-J1850 PWM only (not SAE-1850 VPW)
11	-
12	-
13	-
14	CAN low (ISO 15765-4 and SAE-J2284)
15	L line of ISO 9141-2 and ISO 14230-4
16	-

●Besides traditional applications for diagnostic trouble code readers and automotive scan tools, emerging applications like Location-Based Services (LBS) and Fleet Management Systems (FMS) adopt OBD combined with GPS and telecommunication to realize remote real-time diagnostics.

Built-in Sensors and I/O

■ The AVL-2000PLUS has digital I/O to provide advanced vehicle monitoring and control applications. For example:



●Alarm, light and sound supplier which automatically checks for unusual tags.

●Sends security calls automatically when an unusual door-open is detected.

●An automatic emergency call will be initiated when an airbag deployment is detected.

■ Optional UHF RFID readers with antenna support

●The AVL-2000PLUS extends the benefits of 4-channel UHF RFID technology to in-vehicle applications via the long range UHF RFID readers which are ISO 18000-6C standard complaint and suitable for industrial warehouse management. It can be used in any harsh environment or temperature. It also supports error-free read performance in vehicles. The non line-of-sight tag reading is effectively used in item level identification, warehouse logistics, and security access management. The AVL-2000PLUS SDK contains libraries to read, write, lock and kill RFID tags, which can be easily integrated into software applications.

Key Features :

- High Gain, high performance
- Easy installation
- UV resistance
- IP65 waterproof and dustproof
- Pole mount & wall mount available

Software Development Kits (SDK) and Built-in Software

IEI AVL-2000PLUS SDK

Allows third-parties to develop software to send requests to the protocol firmware to acquire vehicle data

●Detects function key status (F1~F3) to program user interface application

●Implements digital I/O

Offers an easy-to-use 8-bit digital I/O (4 inputs/4 outputs) configuration. Allows you to set digital outputs and read digital inputs.

●Implement Digital I/O

●Multi-channel video capture card provides:

Four active channels video settings
Captured video preview
Frame rate information
Image property settings
Fast configuration and ready-to-run
Complete source code

●Channel Video Capture Card

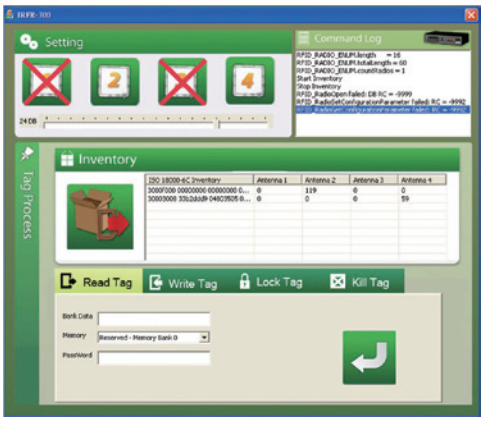
●UHF module provides:

A selection of 4 active antennas.
Antenna in use identification
Interface to read/write/lock/kill tag and retrieve product information such as product names, inventory, place of production, specification and read count information.

●Data provided by OBD-II

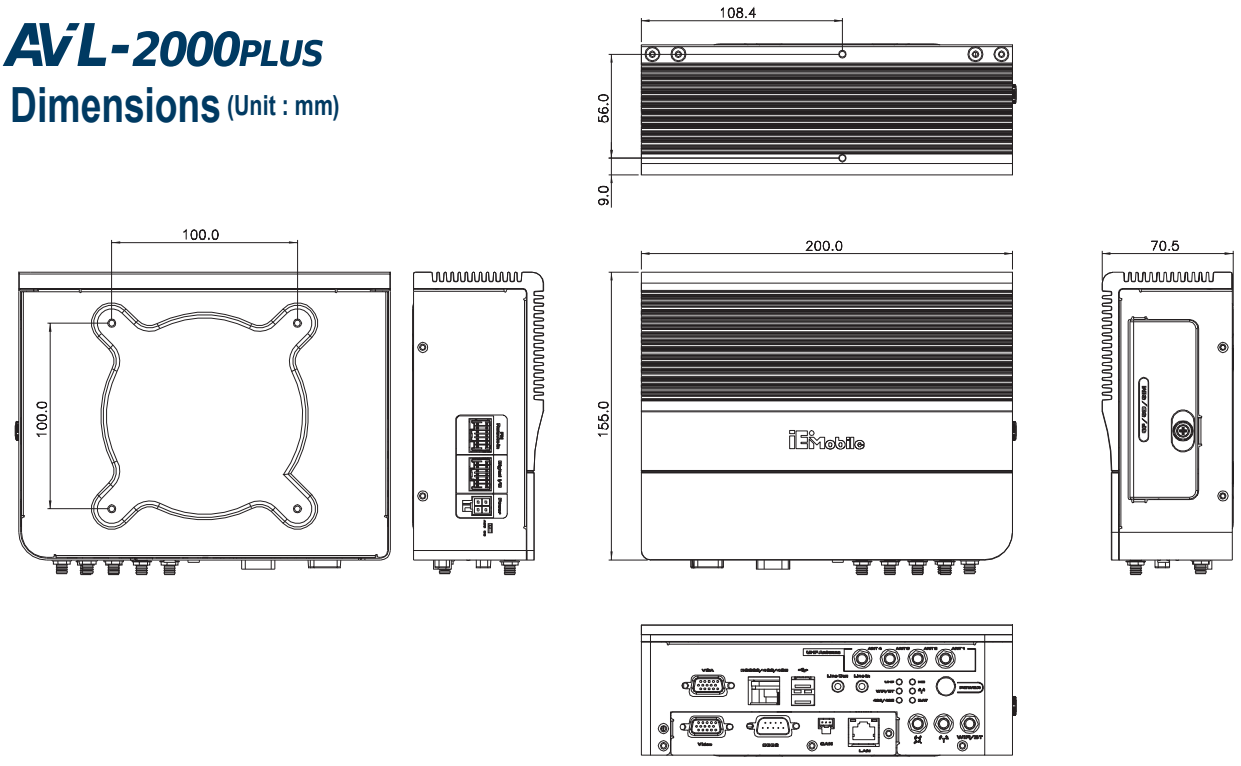
●OBD-II provides:

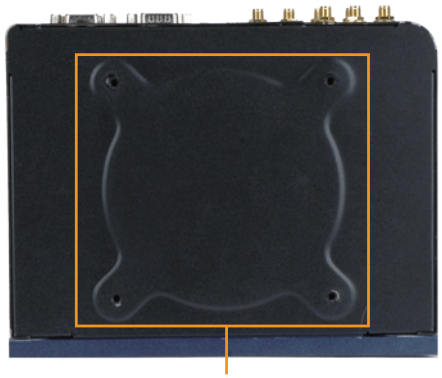
Demo the query results of OBD-II interface with CAN protocol data. There are 4 types of CAN data supported. Also features an interface for users to acquire diagnostic vehicle data and over 79 kinds of vehicle for diagnostic or travel information such as speed, engine loading, engine R.P.M and more.



●UHF Module

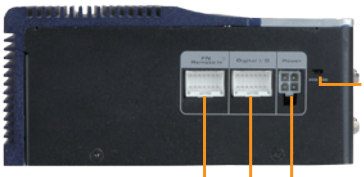
AVL-2000PLUS Dimensions (Unit : mm)





DIN Rail 100 Mount

Easy Access to CF, SD and SIM



ACC/Manual Power Mode Switch

FN Remote In

Digital I/O

12 V DC IN

2 x USB Host

Connectivity LED Indicators

Line-Out

RS-232/422/485

Line-In

4 x UHF Antenna

VGA

Power LED Indicators

Power Button

Video

OBD-II

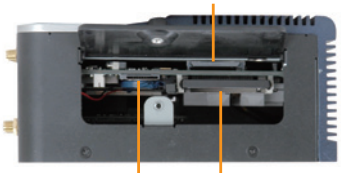
CAN

GPS Antenna

Wi-Fi Antenna

GbE RJ-45

3.75G Antenna



SD Card Slot

SIM Card Slot

CF Card Slot

Specifications

Model	AVL-2000PLUS	
System	CPU	Intel® Atom™ Z510 1.1 GHz
	Chipset	Intel® US15WP
	Operating System	Microsoft® Windows® XP Embedded
	Memory	1 GB DDR2 533 MHz On-board
	Storage	4GB CompactFlash® SD Card Slot
Communication	Wireless LAN	Wi-Fi 802.11b/g/n
	Bluetooth	N/A
	Modem	WCDMA/HSUPA
	GPS	GPS
Multimedia	Audio	1 x Line-in 1 x Line-out
Data Collection	RFID	ISO 18000-6C UHF RFID (Optional)
	Video Capturing	Video Input : 4 channels composite video(NTSC/PAL/SECAM) Frame rate : 4 channels with 120fps@D1 per channel(NTSC), 4 channels with 100fps@D1 per channel(PAL/SECAM)
LED Indicators & Buttons	Indicators	UHF/Wi-Fi/ RS-422/485/HDD/3.75G/BAT/Power Status LED
	Buttons	Power Button
I/O Interface	USB	2 x USB 2.0
	Serial	1 x DB-9 OBD-II 1 x RJ-45 RS-232/422/485
	LAN	1 x 10/100/1000 Mbps GbE RJ-45
	VGA	1 x VGA
	CAN	1 x CAN 2.0b
	Digital I/O	4 Inputs / 4 Outputs
Power	Cigarette Lighter Power	Cigarette Lighter Power Cable DC 9~30V
	ACC Power	Manual power mode and ignition detection supported ACC power on/off mode with software configurable delay time
Environment	Operating Temperature	-20˚C to +70˚C
	Storage Temperature	-30˚C to +80˚C
	Humidity	5%~95% non-condensing
	Certification	CE/FCC/e-Mark/ISO7637
Physical Characteristics	Dimensions (LxWxH) (mm)	200 x 155 x 70
	Net Weight	1978g

Ordering Information

Part Number	Description
AVL-2000P-510/HU-R11	Vehicle PC Box with Intel® Atom™ Z510 1.1GHz CPU, 1GB SDRAM, 802.11 b/g/n Wireless, HSUPA, 4CH 120 FPS Video Capture, OBD-II, GPS with DR, RoHS
AVL-2000P-510/HU/FCC-R11	Vehicle PC Box with Intel® Atom™ Z510 1.1GHz CPU, 1GB SDRAM, 802.11 b/g/n Wireless, HSUPA, 4CH 120 FPS Video Capture, OBD-II, GPS with DR, UHF FCC, RoHS
AVL-2000P-510/HU/ESTI-R11	Vehicle PC Box with Intel® Atom™ Z510 1.1GHz CPU, 1GB SDRAM, 802.11 b/g/n Wireless, HSUPA, 4CH 120 FPS Video Capture, OBD-II, GPS with DR, UHF ETSI, RoHS

Support Function

Part Number	Wireless	Video Capture	GPS	3.75G	UHF RFID
AVL-2000P-510/HU-R11	802.11 b/g/n	4CH 120 FPS	U-blox	Qualcomm	None
AVL-2000P-510/HU/FCC-R11	802.11 b/g/n	4CH 120 FPS	U-blox	Qualcomm	UHF FCC
AVL-2000P-510/HU/ETSI-R11	802.11 b/g/n	4CH 120 FPS	U-blox	Qualcomm	UHF ETSI

Packing List

Item	Part Number	Q'ty
Cigarette Lighter Power Cable	32002-001800-100-RS	1
ACC Power Cable	32002-001900-100-RS	1
RS-232 Cable	32005-000200-200-RS	1
Capture Cable	32007-001400-100-RS	1
OBD-II Cable	32025-000300-100-RS	1
J1939 Cable	32025-000400-100-RS	1
Wi-Fi/BT Antenna	32505-000400-100-RS	1
GPS / 3.75G Integrate Antenna	32506-000100-100-RS	1
Uesr's Manual CD-ROM	7B000-000568-RS	1
IEI One Key Recovery CD	IEI-7B000-000478-RS	1

ACC Power Cable

Capture Cable

J1939 Cable

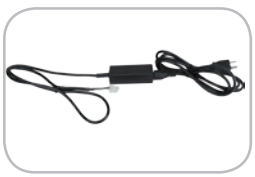
OBD-II Cable

Cigarette Lighter Power Cable

GPS / 3.75G Integrate Antenna

RS-232 Cable

Wi-Fi Antenna


Power Adapter

UHF RFID Cable

UHF RFID Antenna

Optional Accessory List

Item	Part Number	Description
UHF RFID Antenna w/Cable	AVL-2000PLUS-FCC01-R10	PATCH Antenna 915MHz
		RFID Cable 10000MM
	AVL-2000PLUS-ETSI01-R10	PATCH Antenna 867.5MHz
		RFID CABLE 10000MM
Power Adapter	63040-010036-000-RS	Adapter Power; FSP;FSP036-RAB; Active PFC; Vin: 90~264VAC; 36W; Dim: 91.5*37.5*26.0mm; Cable=1500mm; Vout:12VDC; ATX 2*2 Pitch: 4.2mm;RoHS

AVL-3000 New

Advanced Auto Data Server

- Intel® Atom™ N2600 1.6GHz CPU with Windows® 7 OS
- Built-in 2.5” 16 GB SATA SSD
- Built-in Wi-Fi, Bluetooth, HSUPA, and GPS with Dead Reckoning Support
- Built-in VGA Output and NTSC/PAL/SECAM Video Capture with Hardware/Software Compression Support
- Supports vehicle bus protocol (OBD-II/J1939/FMS)
- Optional UHF RFID reader module

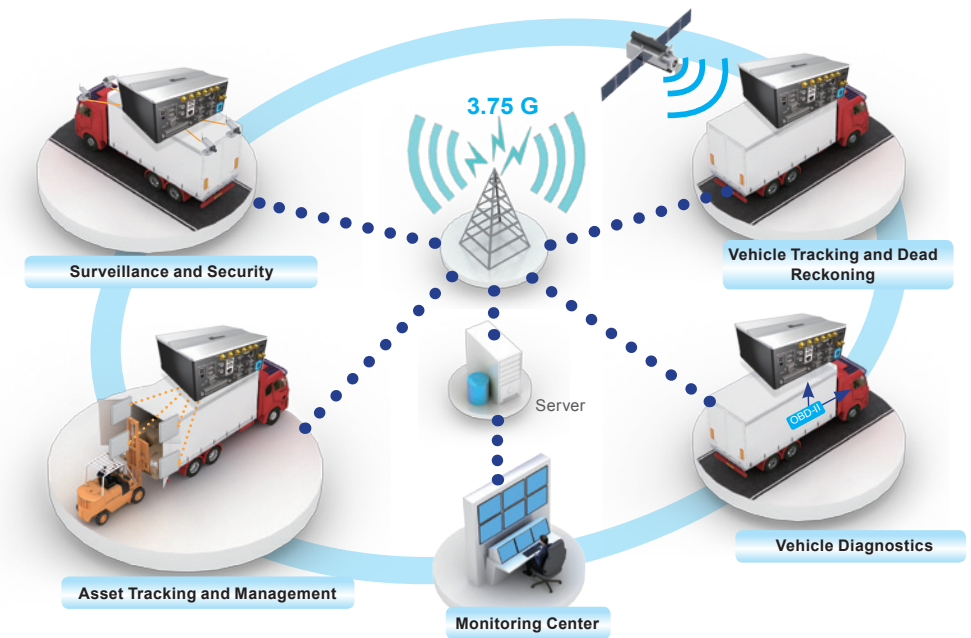
3.75G/ HSUPA | Bluetooth | Wi-Fi | Dead Reckoning | Power Management | Video Capture | UHF | GPS

Advanced Auto Data Server with Upgraded Tracking and Surveillance Function

The AVL-3000 comes integrated with a remote on-line and real time diagnostic system for vehicles via HSUPA/GPRS/GSM, Global Position System (GPS) and On-Board Diagnostics System (OBD) technologies.

The AVL-3000 provides video/audio capture and recording functions. With the optional hardware/software codec solution, the AVL-3000 offers enhanced data streaming performance. Optional functions include UHF RFID Readers for a wide range of industrial and commercial applications, including supply chain management, asset tracking, authentication and access control. These complete advanced functions make an Auto Data Server suitable for accurate vehicle tracking, security ,monitoring, and data collection.

	AVL-2000	AVL-3000
CPU	eMenlow	Cedarview
	Z510 1.1 GHz	D2700/N2800/ N2600
OS	Windows® XP Embedded	Windows® 7 Embedded
Memory	DDR2 533MHz (2 GB max.)	DDR3 1066MHz



2012 New Atom™ Dual Core Platform

Benefit

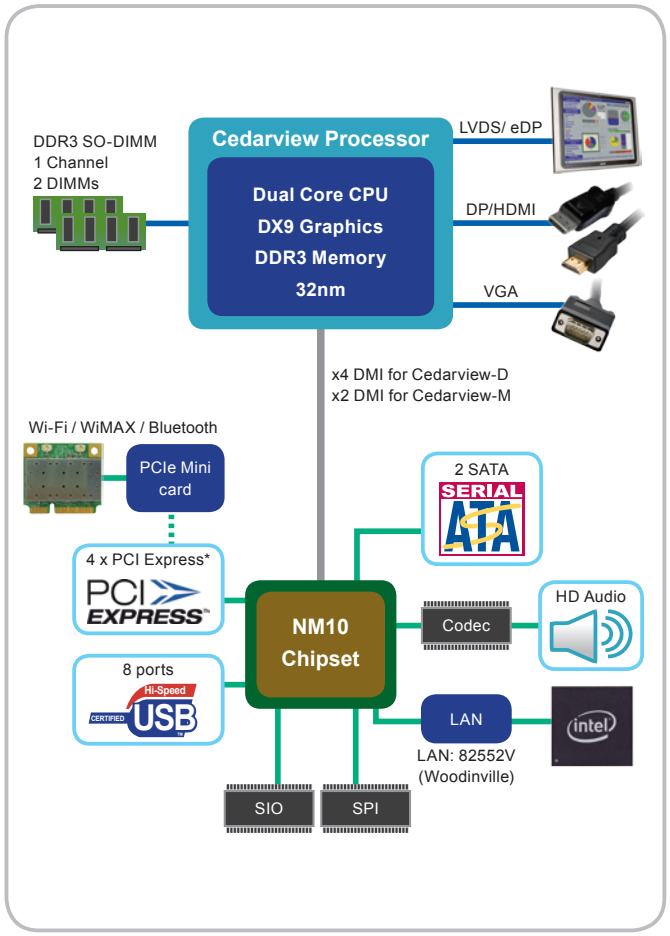
- CPU TDP (3.5/6.5/10W) and average power are lower than Pine Trail (6.5/10/13W)
- Display options including 2 digital ports supprot for extra LVDS/ HDMI/VGA options
- 2 times improved graphics with 2 HD video support
- Faster memory up to DDR3 1066MHz
- HD decoding with Blu-ray support

Specifications Comparison

	Navy Pier (N270)	Pine Trail (D525/D425/N455)	Cedar Trail (D2700/N2800/N2600)
Process	45nm	45nm	32nm
Processor Frequency	N270: 1.6GHz	D525/D524: 1.8GHz N455: 1.66GHz	D2700: 2.13GHz N2800: 1.86GHz N2600: 1.6GHz
CPU TDP	N270: 2.5W	D525: 13W D425: 10W N455: 6.5W	D2700: 10W N2800: 6.5W N2600: 3.5W
Chipset/ PCH TDP	945GSE: 5.5W ICH7M: 1.9W	ICH8M: 2W	Intel® NM10: 1.5W
Memory	DDR2 400/533MHz (2GB max.)	DDR2/DDR3 up to 667 for N455 800MHz for D525/D425 (4GB max.)	DDR3 1066MHz for D2700/N2800 (4GB max.) DDR3 800MHz for N2600 (2GB max.)
Graphics	DX9, OGL 1.4	DX9, OGL 1.5	DX9, OGL 3.0
	Gfx @ 133 MHz	Gfx @ 200 MHz (N455) Gfx @ 400MHz (D525/D425)	Gfx @ 400 MHz (N2600) Gfx @ 640MHz (D2700/N2800)
Video Decode	MPEG2	Discrete 3rd part decoder	MPEG2, H.264, VC-1/ WMV9 Up to 1080p decoding

Note: Standard product is N2600, By customized can upgrade to N2800 and D2700.

Block Diagram



Microsoft® Windows® Embedded Standard 7

Benefit Category	Top Features
Performance/ Reliability	• 64/32-bit support • Less boot time • Improved power management • Aero glass
Compatibility/ Security	• Enhanced driver compatibility • Enhanced application compatibility • Credential manager (allows you to maintain all your credentials related to websites or when you connect to another computer)
Connectivity	• Sensor and location platform • Bluetooth 2.1+EDR and Extended Inquiry Response (EIR) (Windows® XP only supports Bluetooth 2.0+EDR; EIR is not supported by Windows® Vista)
Development/Deployment/ Serving	• Simplified installation (2 tools vs. 4 tools compared with previous versions of wes/xpe); installation wizard (ibw) is also available. • Supports imagex/dism for easier recovery and service solutions • Supports Windows® update

Extended Connectivity

Multi-Channel Real Time Video and Audio Capture Applications

The AVL-3000, featuring multi-channel real time video and audio capture capabilities, is desinged to meet the requirements of modern security systems in the transportation industry. It can reduce loss and damage to goods and assets while increasing the safety of drivers at the same time. The AVL-3000 SDK contains a library of four active channels video demo program, allowing for quick and easy customization of audio/video preview and capture application.

Key Features

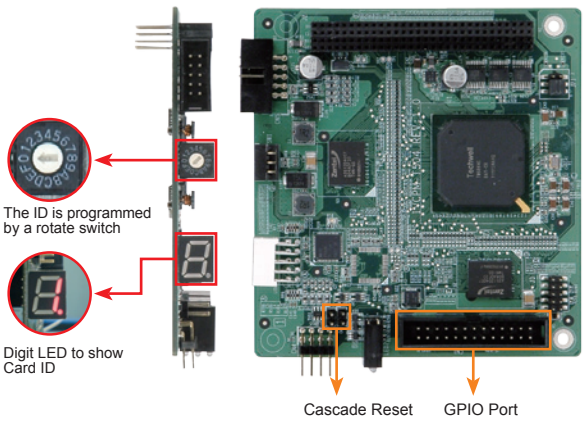
- Internal 4-channel video decoder and audio ADC
- High quality proprietary fast video locking system for non-real-time application
- Supports 4-channel D1 video plus 1-channel audio simultaneously with independent channel control
- Dynamic synchronization: video processing; multiple video format output support Y422, Y420, IYUI/Y411, Y41P, RGB555 and RGB565
- Dual support for Direct Show and Direct Draw
- Accepts all NTSC(M/N/4.43) / PAL(B/D/G/H/I/ K/L/M/N/60) / SECAM standards with auto detection

Two Compression Choices

Hardware Compression

The AVL-3000 utilizes a hardware compression card to capture, compress, and save audio/video information. The specialized hardware makes hardware compression faster than software compression that utilizes a general purpose processor for the job. When the speed at which captured data must be compressed is equal to, or faster, than the speed the storage media is able to accept, it is best to use hardware compression. Hardware compression does not add any additional burden to the host processor.

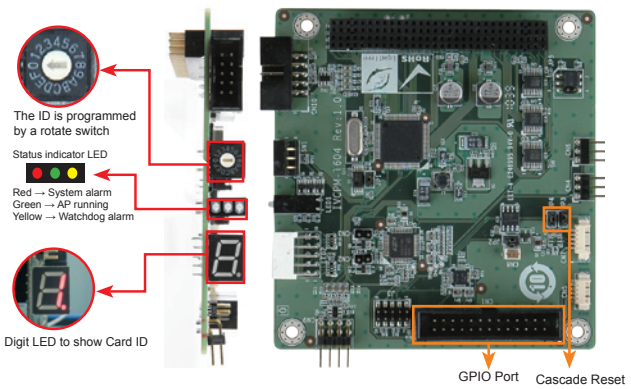
Video processing	
Video compression	Hardware compression, H.264 baseline profile@level 3 encoding, Real-time 4 D1 + 4 CIF dual stream @ 30 fps
Video engine	1 x Techwell 5864
Resolution / Frame rate	NTSC: 720 x 480/ PAL: 720x576
	NTSC: Total 120fps@D1 for 4 channels PAL/SECAM: Total 100fps@D1 for 4 channels



Software Compression

The AVL-3000 utilizes a software compression card to capture, compress, and save audio/video information.
The specialized hardware makes hardware compression faster than software compression that utilizes a general purpose processor for the job. When the speed at which captured data must be compressed is equal to, or faster, than the speed the storage media is able to accept, it is best to use hardware compression.

Video processing	
Video compression	Software compression
Video engine	1 x Conexant Fusion BT878A
Resolution / Frame rate	NTSC: 720x480/ PAL: 720x576
	NTSC: Total 120fps@D1 for 4 channels PAL/SECAM: Total 100fps@D1 for 4 channels
Audio processing	
Audio compression	+#
Sampling rate	8kHz,16kHz, 32kHz, 44.1kHz and 48kHz
Quantization	8-bit,16-bit


The ID is programmed by a rotate switch
Status indicator LED
Red → System alarm
Green → AP running
Yellow → Watchdog alarm
Digit LED to show Card ID
GPIO Port
Cascade Reset

Rich Wireless Communication

Built-in Global Positioning System (GPS) with Dead Reckoning Support

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• 802.11b/g Wi-Fi

Delivers broadband-speed browsing and connectivity, compared to traditional wired LAN connections. Best for near field or ad-hoc data communications.

• Leading the Wireless Revolution

WWAN 2.5G/3.5G/3.75G

Receives the localization coordinate of each vehicle through efficient mobile connectivity.

Technology/Bands

- HSUPA/HSPA/UMTS-800/850/900/1900/2100 MHz
- Quad-band EDGE/GPRS/GSM-850/900/1800/1900 MHz
- Dual-band EV-DO/CDMA-800/1900 MHz

Solid and Expansion Storage

The AVL-3000 uses a 16 GB 2.5" SATA SSD for storage. This design has 2 benefits:

- It allows more information to be stored. This is a great significance for vehicle surveillance applications as video/audio information requires large storage space.
- It is more durable and is hardly to be damaged by vibrations and tough vehicle environment.

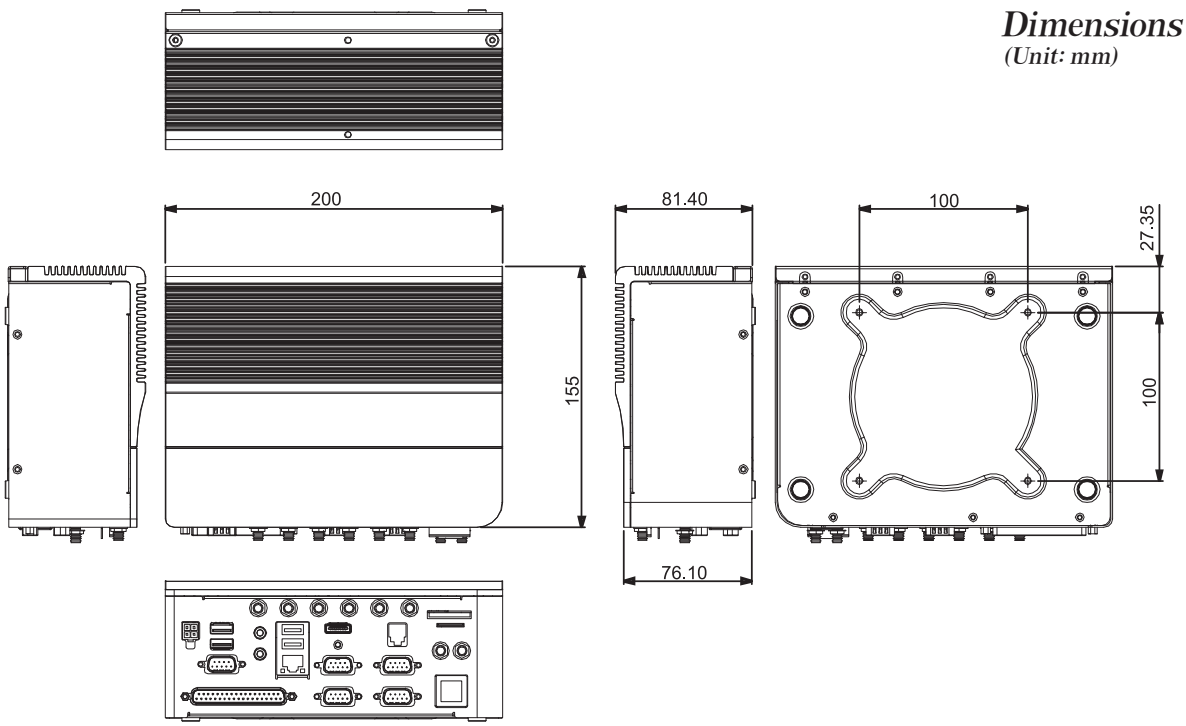
SSD vs HDD

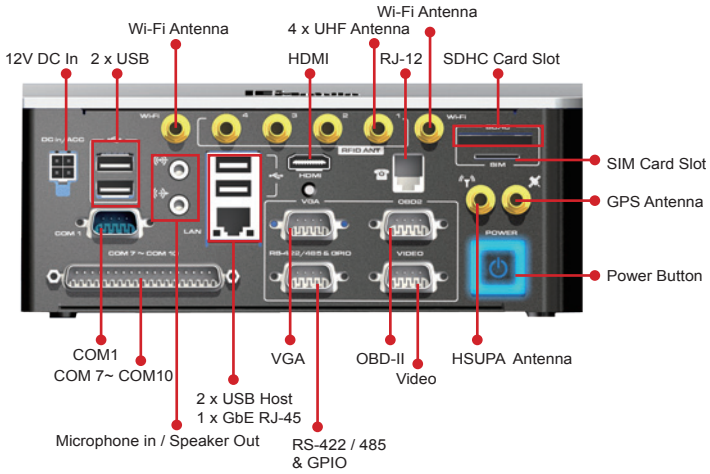
SSD is more suitable for IVI solutions as it can pass the tests of operating shock and vibration.

	HDD	SDD
Life Expectancy	●●●	●●●●●
Operating Temperature	●●●	●●●●●
Storage Temperature	●●●●	●●●●●
Operating Shock	●	●●●●●
Operating Vibration	●	●●●●●
Humidity	●●●●	●●●●●
Altitude	●●●	●●●●●
Power Read/Write	●●●	●●●●
Capacity	●●●●●	●●●●

Dimensions

(Unit: mm)





Specifications

Model		AVL-3000
System	CPU	Intel® Atom™ processor N2600 1.6Ghz
	Chipset	Intel® NM10
	Operating System	Windows® Embedded Standard 7 E
	Memory	2GB 800 MHz DDR3
	Storagy	1 x Built-in 16G SATA SSD
		1 x SDXC Slot for data storage
Communication	Wireless LAN	802.11b/g/n
	Bluetooth	Bluetooth V2.0+EDR (Class I)
	3.75G	HSUPA/UMTS-800/850/900/1900/2100 MHz
		Quad-band EDGE/GPRS
		GSM-850/900/1800/1900 MHz
		Dual-band EV-DO/CDMA
	GPS	GPS
Data Collection	RFID	ISO18000-6C UHF module (option)
Multimedia	Audio	1 x MIC IN 1 x Line-out
	Camera	4 x Channel camera D1 120FPS
Compress	HW Compression	IVCPM-T504
	SW Compression	IVCPM-T604
LED Indicator		1 x Power LED

I/O Interface		4 x USB
		1 x OBD-II
		6 x COM port: DB-9 (COM1), RS-422/485 (COM4, 4-PIN), DB-37 (COM7~COM10)
		1 x GIGA LAN
		1 x VGA support up to 1920 x 1200
		4 x VIDEO IN
		1 x 8 bit Digital I/O (selectable by software) 4 x DI 4 x DO
		1 x Line in
		1 x Line out
		1 X RJ11 3.5G Voice
		1 x HDMI
Power	Power Input	Cigarette Lighter Power Cable
	Vehicle Power	ACC Power Cable
Environment	Operating Temperature	-20°C~70°C
	Storage Temperature	-30°C ~80°C
	Humidity	5%~95% non-condensing
	Drop Survival	ISO 16754
	Certification	CE/FCC/e-Mark
Physical Characteristics	Dimensions (LxWxH) (mm)	200 x 150 x 76
	Weight	2015 g

Ordering Information

Part No.	Description
AVL-3000-N26-HC-R10	Vehicle PC Box with Intel® Atom™ N2600 1.6GHz CPU, Windows® 7 OS, 2GB SDRAM, 16GB 2.5" SSD, 802.11 b/g/n Wireless, HSUPA, 4CH 120 FPS Video Capture, OBD-II, GPS, Hareware Codec, RoHS

Packing List

Item	Q'ty
GPS/3.75G Integrate Antenna	1
Wi-Fi Antenna	2
ACC Power Cable	1